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Wireless Monitoring

Tomoaki Ohtsuki
Keio University

1. Introduction

This article introduces one of our proposed wireless monitoring methods in ambient intelligence using array antenna, referred to as array sensor. The array sensor exploits an antenna array on the receiver side and decomposes received signals into eigenvectors and eigenvalues. It uses these components depending on its applications, such as intrusion detection, monitoring, and passive localization. When an event (e.g. intrusion) occurs, the propagation environment changes, and thus the eigenvector changes. Based on the change of eigenvector, we can detect an event accurately. Using machine learning based on these components, the array sensor can classify several more complex states and activities. Since the array sensor exploits not an exact direction of arrival (DOA) information but the change of radio propagation, it does not need a precisely-designed array antenna where its antenna positions are designed precisely and it needs calibration; just plural antennas are needed so that the sensor becomes low cost and is easy to install.

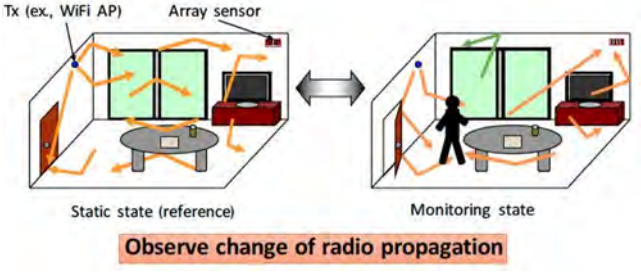

Fig. 1 Concept of array sensor

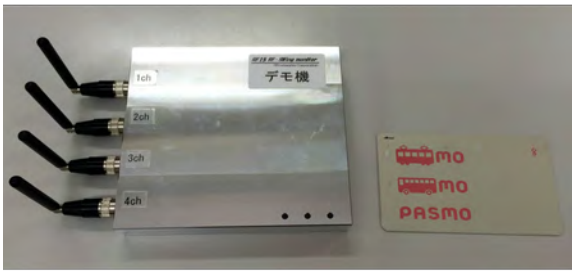

Fig. 2 Array sensor

2. Array Sensor

Figure 1 shows a concept of array sensor and Fig. 2 shows an example of the array sensor. When a pair of transmitter and receiver are fixed, the signal subspace spanned by eigenvector changes when the indoor environment of interest changes. For detecting simple events, such as intrusion, we can use a simple threshold detection based on change of first eigenvector. For detecting and classifying more complex states and activities, such as sitting in a bathtub and falling in a bathroom, we use machine learning technique, such as support vector machine (SVM). We explain how these methods are implemented in the array sensor.

A signal subspace spanned by an eigenvector is obtained as the first eigenvector by eigenvalue decomposition (EVD) of the data correlation matrix. Thus, the eigenvector spanning signal subspace consists of the linear coupling of the steering vectors from incident multipath signals. The incident multipath signals go through every indoor point of interest. Therefore, the eigenvector spanning signal subspace represents a wave propagation. When the environment of interest changes, the wave propagation changes and thus the eigenvector spanning signal subspace changes. Consequently, the eigenvector spanning signal subspace is inherent to each environment of interest.

In the array sensor, we use various features obtained by array antenna. Some of them is the first eigenvector and its corresponding eigenvalue spanning signal subspace. Figure 3 shows an example of change of cost functions based on the first eigenvalue and its corresponding eigenvector spanning signal subspace to detect events, $P(t)$ and $Q(t)$, respectively, obtained in the room shown in Fig. 4, where a person takes action shown in the figure. Both cost functions are the correlation with those obtained in advance when no one is in the room. Thus, the closer the value of cost function is to 1, the smaller the change of environment, and vice versa. The eigenvector is stationary even in the noise and fading environment, because it does not

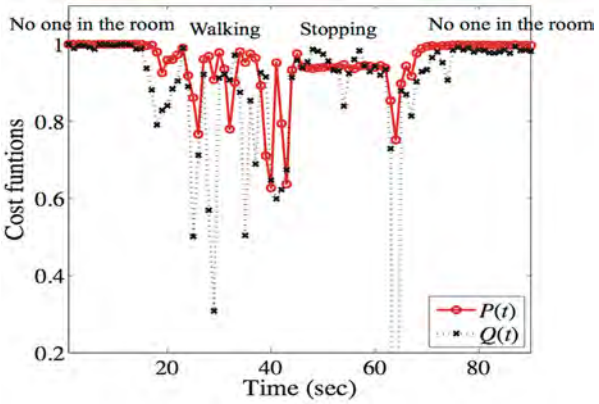

Fig. 3 Cost functions

include RSS information. The eigenvalue is less stationary than the eigenvector, however, the eigenvector can detect even the small events. We can see that the array sensor can detect the activities with simple cost functions.

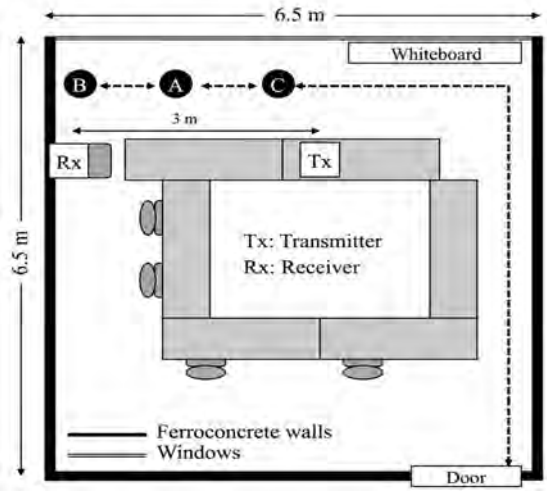

Fig. 4 Experimental environment

For detecting and classifying more complex states and activities, such as sitting in a bathtub and falling in a bathroom, we use machine learning technique, such as SVM. Owing to its excellent generalization capabilities, SVM has shown several advantages in prediction, regression, and estimation over some of the classical approaches in a wide range of applications. SVM is a supervised computer learning method that exploits prior knowledge of similar scenarios and functions to identify unknown (never experienced before) cases or similar functions. Once the SVM has been trained, all future unknown samples can be classified in real time. If we use machine learning for the safety system like array sensor, there are some essential points as follows: ability to detect in real time or semi-real time; work on nonlinear problem; use as many features as possible. SVM meets the above conditions.

3. Localization Using Array Sensor

The array sensor can localize a person based on a fingerprinting technique. In a fingerprinting first we create a map (database) of a given area based on the feature values for a given location. Live feature values are then compared to the fingerprint (database) to find the closest match and generate a predicted location. As a localization using fingerprinting, Wi-Fi localization using fingerprinting is well known. Here we explain localization using array sensor.

In the training phase, we get the received signals when a person stands at each position. From the signals, we compute the cost functions. We also compute the cost functions based on eigenvectors and eigenvalues with spatial smoothing processing (SSP) for each data. This is because by applying SSP we can get more feature vectors that result in better classification performance based on SVM.

In the localization algorithm using array sensor, in the testing phase, although we get cost functions and the feature vector in the same way as in the training phase, we do not know what position this feature vector is classified to. However, once the SVM has been trained, then all future unknown samples can be classified in real time.

We show one of experimental results of localization using array sensor. The experimental room was 7m×7m. It is a usual class room constructed of ferro-concrete walls and glass windows on our campus. There are obstacles in front of each transmitter, and then the transmitters and receiver are set based on the non-line of sight (NLOS) conditions. In this experiment the localization using array sensor achieves a high accuracy of 76.47% and an RMSE of 1.61 m, even though it is a passive localization technique.

4. Conclusions

This article introduces our proposed wireless monitoring system using array antenna, referred to as array sensor. The array sensor exploits an antenna array on the receiver side and decomposes received signals into eigenvectors and eigenvalues. The array sensor exploits these components depending on its applications, such as intrusion detection, monitoring, and passive localization. Using machine learning based on these components, the array sensor can classify several more complex states and activities without invasion of privacy. Although the name is array sensor, it does not necessarily need a precisely-designed array antenna; no calibration is needed.

We presented some of our experimental results, such as classifying person's activities in bathroom and office room, and localization performance of person's position in the office room. The proposed array sensor can be useful for monitoring without invasion of privacy, such as monitoring elderly person living alone, monitoring person in bathroom and restroom where camera cannot be installed. The ability of monitoring a person without invasion of privacy is a big advantage of array sensor. The array sensor would be helpful particularly aging society like Japan.

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A Variety of Activity Experiences for 35 Years

− Technical Research, Standardization, Sales & Marketing Activities −

Kanshiro Kashiki
KDDI R&D Labs. Inc.

1. Introduction

Since I joined KDDI (previously KDD) in 1981, I have been engaged in a variety of activities as a company employee, which include technical research and development, standardization of frequency assignment, business planning, and sales & marketing activities. I follow the instructions of the company. It is thought that members of the IEICE do not have such a variety of activities. In the manuscript, I introduce some experiences that would be attractive for IEICE members and the knowledge acquired from such experiences. As a consequence, such experiences have been sufficiently satisfactory for the author.

2. Personal History

My main work record and experience are as follows;

(i) Research and development (R&D):
Wireless systems and elementary technologies that consist of such systems

(ii) Standardization:
Activities in the ITU-R (International Telecommunication Union, Radiocommunication sector)

(iii) Sales & marketing:
Frontline activities for corporate customers and some individuals

Other than these, I was engaged in business planning and system operation. Herein, the above three items are mainly focused.

3. Research and Development (R&D) Activities

The author has been engaged in many wireless systems, from real ones to conceptual ones like the Cognitive Radio System. These are as follows:

- INMARSAT System,
- Optical Inter-Satellite Link System,
- High Altitude Platform System (HAPS),
- Personal Handy Phone System (PHS),
- Cellular System,
- Heterogeneous Radio System,
- Cognitive Radio System.

Within these systems, the author selected three items to present in this manuscript. From the past activities, the author acquired valuable experiences and extensive knowledges.

(a) INMARSAT System

The first job after joining KDDI was R&D in the digitalization of the INMARSAT (International Maritime Satellite Organization) system, which was a legacy analog system. Through the R&D, the author learned how to proceed with new technical R&D. The INMARSAT is satellite system, whose customers are mobile users on the Pacific Ocean and on the continents all over the world. This major R&D proceeded in a sequenced manner as follows [1-2];

(1) Selection of optimum fundamental technology consisting of INMARSAT system [3]
(2) Study of the performance of these technologies
(3) Hardware development of each technology and performance evaluation

Fig. 1 Many Antenna in KDDI Yamaguchi Satellite Center (as of the year 2012)

(4) Hardware development of the total system
(5) Indoor evaluation of the developed facilities
(6) Outdoor evaluation carried out at the KDDI Yamaguchi Satellite Center (see Fig. 1 as of 2012) using the real on-orbit INMARSAT satellite
(7) Field test evaluation of the test facilities onboard a vessel of 700 tons sailing near Japan Island (see Fig. 2, which is a photograph of the experiment activities)

The major project was accomplished in cooperation with company colleagues, INMARSAT staff, and equipment suppliers of the communication unit and antenna unit.

Through the project, the author acquired the technical knowledge in error correction (Viterbi decoding), digital-processed modulation/demodulation (modem), and voice coding technologies. The digital-processed modem technologies were later helpful in the understanding of SDR (Software Defined Radio) and the study of DBF (Digital Beam Forming) antennas.

Since this project was the first job, the author worked under a supervisor. Consequently, he could not understand the scale of the project when working in it. Now, as he looks back, he surprisingly feels it was an enormously splendid project.

Fig. 2 Author and Experimental Facilities in the Vessel
(Many instruments in very narrow room)

The total field experiments successively finished with significant results, which were published for an international conference [2]. While the field trials on the ocean were accompanied by problems with the communication unit and measurement equipment, we enjoyed fishing during rest periods.

The project did not necessarily favorably proceed. When a problem arose, experimental staff tried to find a solution to the problem step by step by distinguishing the normal points from the abnormal points. This experience was extremely useful in the successive research life of the author.

(b) Optical Inter-Satellite Link (ISL) System

Optical ISL is a system that offers an optical communication link between geostationary satellites, which was the first trial project in Japan. The R&D program was carried out in the ATR (Advanced Telecommunications Research Institute International), which was newly established in 1981. The author was on temporary assignment from KDDI.

There was no experienced researcher in Japan at that time, so the author started a survey of the related literature and optical devices. Since optical fiber technology has been actively investigated, there are many technologies applicable to optical ISL. The most important technology in optical ISL is optical tracking because of the great distances of the satellites, and the radiation angle of the optical signal is extremely narrow. The author analytically studied the control method for optical tracking.

In this project, the author developed an optical transmitter, whose output power is 100 mW with 0.8 μm wavelength. Since the output power was so large, he inserted film to reduce the power between the transmitter and power tester. The film obviously melted, which was frightening.

(c) Cognitive Radio System (CRS)

Since 2005, the author has been engaged in an R&D project funded by the Ministry of Internal Affairs and Communications, Japan. The project covers “cognitive radio system [4]” and “heterogeneous radio system [5]”. The main goal of the project is the efficient use of limited radio frequencies.

These terms—“cognitive radio” and “heterogeneous radio” were newly proposed at that time, so the first job was to familiarize and promote the terms. Presently, those terms are well used, though the method of use is sometimes strange for the author.

Regarding the heterogeneous radio system, we developed a test bed of three wireless systems: Wi-Fi,

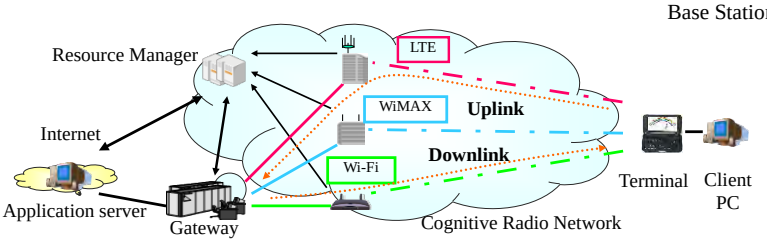

Fig. 3 (a) Concept of Heterogeneous Radio System

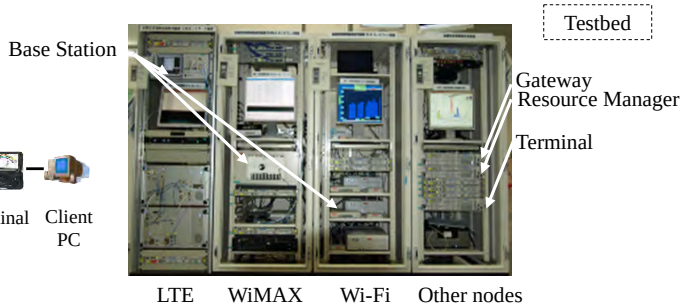

Fig. 3 (b) Test bed of Heterogeneous Radio System

WiMAX, and LTE. The concept of the system is shown in Fig. 3 (a). The three wireless systems are switched or aggregated, depending on the surrounding radio conditions.

Figure 3 (b) shows the manufactured test bed of the heterogeneous radio system, which is fabricated from commercially available equipment. We developed the control portion of the test bed ourselves. We demonstrated the large-scale test bed at a technical exhibition. Many attendees were interested because such big ones were not recently demonstrated.

As for the cognitive radio system, recently the author has been engaged in a study regarding a signal detection scheme called feature detection with high sensitivity [6-7]. Although the WRC15 (World Radiocommunication Conference) in ITU was held, new frequency bands have not been unfortunately assigned to the IMT (International Mobile Telecommunication).

Accordingly, cellular operators should offer a communication service within the existing assigned frequency bandwidth. Therefore, the signal detection technology (or equally sensing technology) becomes more essentially important than ever.

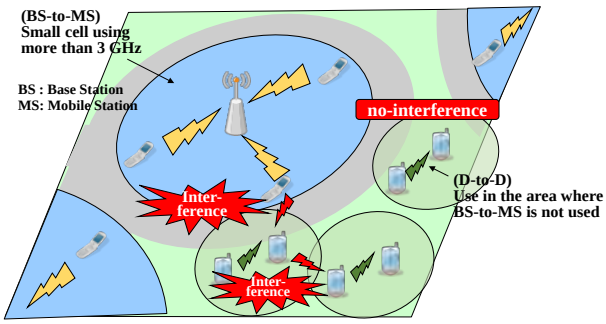

Fig. 4 Applied example system of the signal detection scheme (D-to-D communication system)

Figure 4 shows an applied example system of the signal detection scheme of a D-to-D (Device-to-Device) communication system. The system includes the coverage area of the mobile cellular service and that of D-to-D communication. When higher frequencies above 3 GHz would be used, it will be more difficult for the BS-to-MS (Base Station-to-Mobile Station) signals to cover a broad Macro service area compared to the lower frequency such as 800 MHz. Consequently, there will be areas where BS-to-MS signals are not used. In such an area, D-to-D communication could be used instead. The depicted system in Fig. 4 will be applicable to IoT (Internet of Things).

As for the principal trial point in R&D activities, the author usually examines analytical studies no matter how the software simulations were obtained. Simulation results show only numerical data in most cases. The author believes that the details of performance characteristics could be explained simply by the analytical attempts.

4. Standardization Activities in ITU-R

Herein, the experience regarding standardization activities in ITU-R (International Telecommunication Union, Radiocommunication sector) are described. This activity is not directly related to R&D performance, but useful for the promotion of “cognitive radio system”, which was described in the previous section.

The ITU-R mainly works for the formulation of Radio Regulation. Furthermore, it works also for the promotion of new technology. The technical item of a cognitive radio system is a typical example, whose definition is determined as follows [4]:

> **Cognitive Radio System (CRS)**: A radio system employing technology that allows the system to obtain knowledge of its operational and geographical environment, established policies and its internal state; to dynamically and autonomously adjust its operational parameters and protocols according to its obtained knowledge in order to achieve predefined objectives; and to learn from the results obtained.

In parallel with the definition, we developed two ITU-R Reports [8] and [9] accomplished by the leadership of Japan. One result of the Report is depicted in Fig. 5. At the starting point of Report development, Japan and a few other countries contributed, and the Report did not generate much debate. As the CRS became well known, many contributions were submitted, therefore more discussions were held and the development speed slowed. Within the contributions papers, purely technical papers were seen. Since, the role of the ITU-R Report was to explain the new technology in understandable terms, such technical papers seemed inappropriate.

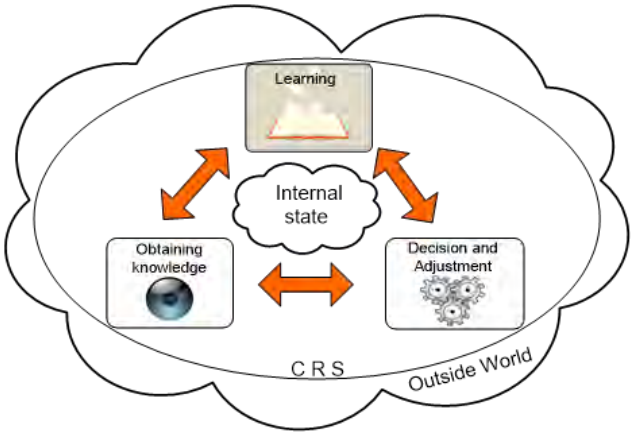

Fig. 5 Concept of Cognitive Radio System [8]

The ITU-R held many meetings with the study groups and working parties, depending on the telecommunication services, such as fixed service, mobile service, and mobile satellite service. The author attends these different conferences. From such experiences, the author feels that the chair with superior individuality successively proceeded with the meeting to a satisfactory negotiation and agreement.

Generally, the international standardization meeting is business tactics with some negotiations and compromises. It may happen that the conclusion changes in one night. The author has experienced such changes. To achieve the good result, it is most important to continue and accomplish the given job with patience.

5. Sales & Marketing Activities

Distinct experiences of the author are frontline sales & marketing activities, which are different from the usual technical researcher or engineer. Furthermore, he had two occasions to participate in sales activities. The first was sales for a corporate customer to handle an international dedicated circuit and solution products. When the monopolization of the international telecommunication service was removed in 1985, the author was unexpectedly moved to the sales department.

The author believes that he was a superior salesperson, who sold large solution products. Unfortunately, he could not feel much pleasure. He took pleasure in producing technical manuscript such as academic literature, conference paper and patent.

The other was sales activities regarding the INMARSAT service. As described in Sec. 3 (a), the author was engaged in the R&D for INMARSAT, so he did not have a mismatch in skills and interests. The customer for INMARSAT service ranges very widely from the individual user to the large organization, which includes explorers of the Arctic, owners of tuna boats, owners of cargo ships, foreign embassy staff in Japan, Japanese governmental ministry, and others. Such activities were very attractive. One reason is that the author was simultaneously working on standardization in ITU-R at the same time.

In addition, the author was engaged in the business planning and the sales & marketing department in the PHS operator days. In this company, many personnel were sent from many kinds of organization. They were from a trading company, railway company, electric-power company, in addition to the telecommunication service company. Since the business category differs, the way of thinking differs. The author obtains a variety of knowledge and viewpoints from them.

6. Concluding Remarks

A variety of business activities that a usual researcher would not experience are described at will. Generally, corporate persons cannot select the job category. It is said that we have to make an earnest attempt for a given job, while it is not recommended that the pure researcher will intend to experience the sales activities.

7. Acknowledgement

I would like to expresses thanks to all member relating to the research life in University days and KDDI days. Especially, I highly appreciate Professor Norihiko Morinaga, who gives guidance the communication theory and the stochastic theory, which is fundamental perspective throughout my R&D activities.

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Renewals of Sister Society Agreement between IEICE-CS and CIC and between IEICE-CS and KICS


Yasunori Suzuki[1] and Yukihiko Okumura[2]

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1. Introduction

This letter reports the renewals of the sister society (SS) agreement between IEICE-CS (IEICE Communications Society) and CIC (The China Institute of Communications) and between IEICE-CS and KICS (The Korean Institute of Communications and Information Sciences).

2. Signing Ceremonies

2.1 CIC

The signing ceremony of SS agreement between IEICE-CS and CIC was held at lunch time on October 15th, 2015 at Kyoto Brighton Hotel during APCC 2015 (The 21st Asia-Pacific Conference on Communications). From CIC, Vice President General, Mr. Song Tong, and Deputy Director of Department of Academy, Mr. Ma Bin attended the signing ceremony while from IEICE-CS, the President, Prof. Masahiro Umehira, the President-Elect, Prof. Masayuki Murata, the Chair of Editional Board, Prof. Hidenori Nakazato, Vice President, Prof. Tomoaki Ohtsuki, Vice President, Prof. Nobuyoshi Kikuma, Director of Planning and Member Activities, Dr. Yasunori Suzuki, and Director of International Cooperation, Dr. Yukihiko Okumura attended.

Figure 1 shows the photograph of the signing ceremony. Figure 2 shows the photograph of the signing ceremony attendees from IEICE-CS and CIC. The cooperation agreement between CIC and IEICE-CS was updated. This agreement will be effective to the end of 2017.

After the signing ceremony, the president Prof. Masahiro Umehira introduced the current status and activities of IEICE-CS. He mentioned that he hopes the opportunity will cement the cooperative relationship between two societies. The Vice President General Mr. Song Tong intruded an overview and mission of CIC. He also mentioned that he expects the cooperative relationship between two societies. The Deputy Director of Department of Academy, Mr. Ma Bin presented the international conference organized by CIC. The signing ceremony of the sister society agreement renewal between IEICE-CS and CIC was conducted in a friendly atmosphere.

Fig. 1 Signing ceremony of sister society agreement between IEICE-CS and CIC.
Left: Vice President General of CIC, Mr. Song Tong
Right: President of IEICE-CS, Prof. Masahiro Umehira

Fig. 2 Photograph of signing ceremony attendees from IEICE-CS and CIC.

2.2 KICS

The signing ceremony of SS agreement between IEICE-CS and KICS was held at right before the banquet of APCC 2016 on October 15th, 2015 at Kyoto Brighton Hotel. From KICS, the President, Prof. Jong-Seon No, Vice President, Prof. Dong Ku Kim, Vice President, Prof. Yeong Min Jang, Vice President, Prof. Chung Gu Kang, and Auditor, Prof. You-Ze Cho attended while from IEICE-CS, the President, Prof. Masahiro Umehira, the President-Elect, Prof. Masayuki Murata, the Chair of Editional Board, Prof. Hidenori Nakazato, Vice President, Prof. Tomoaki Ohtsuki, and Director of International Cooperation, Director of Planning and Member Activities, Dr. Yasunori Suzuki, and Director of International Cooperation, Dr. Yukihiko Okumura attended.

Figure 3 shows the photograph of the signing ceremony. Figure 4 shows the photograph of the signing ceremony attendees from IEICE-CS and KICS.

The cooperation agreement between KICS and IEICE-CS, and the dual membership side agreement between KICS and IEICE-CS were updated. These agreements will be effective to the end of 2018.

After the signing ceremony, the president Prof. Masahiro Umehira introduced the current status and activities of IEICE-CS. He mentioned that he hopes the opportunity will cement the cooperative relationship between two societies. The President Prof. Jong-Seon No intruded the activities and status of KICS. He also mentioned that he expects the cooperative relationship between two societies. The signing ceremony of the sister society agreement renewal between IEICE-CS and KICS was conducted in a friendly atmosphere.

Fig. 3 Signing ceremony of sister society agreement between IEICE-CS and KICS.
Left: President of KICS, Prof. Jong-Seon No
Right: President of IEICE-CS, Prof. Masahiro Umehira

Fig. 4 Photograph of signing ceremony attendees from IEICE-CS and KICS.

3. Conclusion

This letter reported the renewals of the SS agreement between IEICE-CS and CIC, and between IEICE-CS and KICS. These signing ceremonies were advanced in a very good atmosphere, while we made the future of cooperation.

Acknowledgment

The authors would like to thank Mr. Noboru Sano of YRP R&D Promotion Committee, Ms. Cai Liling of the DOCOMO Beijing Communications Laboratories, and Dr. Hidetoshi Kayama of the President of the DOCOMO Beijing Communications Laboratories for offering help in the renewal sister society agreement between IEICE-CS and CIC.

Report on the 29th Optical Communication Systems Symposium
"Shaping the future with information technology and optical communication"

Technical Committee on Optical Communication Systems

1. Introduction

The 29th Optical Communication Systems (OCS) Symposium, sponsored by the IEICE Technical Committee on OCS, was held on Dec. 17–18, 2015 at the Toray Human Resources Development Center in Mishima City, Shizuoka, Japan. The symposium was organized in cooperation with the IEEE Photonics Society Japan Chapter, the IEEE Communications Society Japan Chapter, the Photonic Internet Forum (PIF), and the IEICE Technical Committees on Photonic Network (PN) and Extremely Advanced Optical Transmission Technologies (EXAT). There were 207 participants this year, and 29 exhibitors also participated in the symposium. The subtitle of this year's symposium was "Shaping the future with information technology and optical communication," which was intended for optical communication engineers to discuss their role in business and services in future ICT smart society.

2. Technical Sessions

After the opening address by Mr. Kiyoshi Fukuchi (IEICE OCS committee chair), presenting an overview of recent and future activities of the OCS technical committee, the first technical session started with a plenary talk by Prof. Masatoshi Ishikawa (University of Tokyo) entitled "Frontiers in intelligent systems enabled by ultrafast image processing" (Fig. 1). He described the basic ideas and concepts behind ultrafast image processing technologies such as ultrahigh-speed sampling, system architecture and algorithm for low-latency feedback control. He also presented a wide variety of applications including game, robotics, and automated driving. His presentation featured a number of video demonstrations, which attracted a lot of interest and gave a convincing impression among the audience.

Fig. 1 Plenary talk by Prof. M. Ishikawa.

After the plenary session, we had a poster session, which consisted of 21 contributions by young researchers and four award winners (Fig. 2). After that, there was a workshop on innovative information processing technologies, which included the following four invited talks (Fig. 3): coherent Ising machine using laser networks by Prof. Shoko Utsunomiya (National Institute of Informatics), visualization and control of brain data by Dr. Yoshinori Yamakawa (Cabinet Office, Government Of Japan), exam-solving robots by Prof. Takuya Matsuzaki (Nagoya University), and high-performance computing toward post-Moore era by Prof. Satoshi Matsuoka (Tokyo Institute of Technology). The workshop provided a unique opportunity for us to understand high potential as well as future requirements of optical communication technologies expected from these novel applications.

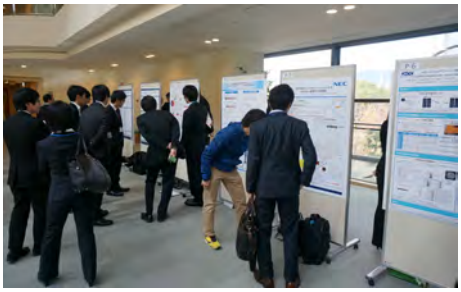


Fig. 2 Snapshot at poster session.

Fig. 3 Presenters of Workshop 1: from left, Prof. S. Utsunomiya, Dr. Y. Yamakawa, Prof. T. Matsuzaki, and Prof. S. Matsuoka.

The second day of the symposium started with four invited lectures featuring a wide variety of applications related to optical communications and networks (Fig. 4). The first lecture was "Evolution of mobile communication toward 2020" given by Dr. Masanobu Fujioka (Ericsson Japan), who overviewed the recent trend in mobile networks and future perspective for 5G. Next, Prof. Toshihiko Baba (Yokohama National University) gave an invited lecture entitled "Applications of photonic crystal devices to telecommunication and medicine" (organized by IEEE Photonics Society Japan Chapter). He presented the fundamentals and device applications of slow light

phenomena and the latest progress on nano-lasers for bio-sensing. The third invited lecture was given by Dr. Akira Matsunaga (KDDI) entitled “Prospects of mobile communication network toward 5G era” (organized by IEEE Communications Society Japan Chapter). He overviewed 5G radio access technologies and talked about their progress from the viewpoint of broadband enhancement, massive machine-type communication for IoT/M2M, and low latency communications. Finally, Dr. Tomoyuki Mishina (NHK) gave a talk on “Multi-view and three-dimensional video technologies developed in NHK.” He described the principle of integral three-dimensional TV without wearing special glasses based on accurate modeling of our spatial recognition of an image with depth, and presented the recent development of multi-view video and its applications such as movies and live broadcasting of sports.

Fig. 4 Invited lecturers: from left, Dr. M. Fujioka, Prof. T. Baba, Dr. A. Matsunaga, and Dr. T. Mishina.

The afternoon session of the second day was the other workshop featuring future large-capacity optical communication beyond 400G, which consisted of the following four invited talks (Fig. 5): Dr. Takeshi Hoshida (Fujitsu) on next-generation terrestrial systems, Dr. Katsuhiro Shimizu (Mitsubishi Electric) on upgrades in submarine cables and systems, Dr. Takahiro Nakamura (PETRA) on chip-size ultrafast optical transceivers with low power consumption, and Prof. Toshihiko Hirooka (Tohoku University) on multi-level modulation and multiplexing. The workshop served as an opportunity to consider future directions of optical communication technologies to meet expectations delivered in other sessions.

Fig. 5 Presenters of Workshop 2: from left, Dr. T. Hoshida, Dr. K. Shimizu, Dr. T. Nakamura, and Prof. T. Hirooka.

3. Rump Session

In the evening of Dec. 17, we organized a rump session with a topic of “What is commoditization?” which was hosted by Prof. Koji Igarashi (Osaka University). First, in order to stimulate the discussion, Dr. Hideki Isono (Fujitsu Optical Components) and Dr. Masahito Tomizawa (NTT) gave us a short presentation on possible commoditization risks that optical devices and systems are facing with. The attendees then exchanged opinions by showing examples of commoditization that we see around us and extensively discussed key issues and ideas for overcoming the difficulties.

4. Award Ceremony

During the technical sessions, we celebrated this year’s OCS award winners at the award ceremony (Fig. 6). The OCS Technical Committee presented two awards: The “IEICE Communication Society OCS Best Paper Award” and the “IEICE Communication Society OCS Young Researchers Award” for excellent presentations at OCS technical committee meetings throughout the year. The OCS chair presented a testimonial, a glass trophy, and a book token to each award recipient. This year’s winners are as follows:

- OCS Best Paper Award: “Full set mode analysis of three mode fibers calculated from polarization components of near-field pattern,” by Prof. Yasuo Kokubun (Yokohama National University)
- OCS Young Researchers Award: Dr. Yuki Matsuda (Osaka University; presently with NTT Docomo) for “Optical eigenvalue modulation and demodulation scheme based on pulse width modulation”
- OCS Young Researchers Award: Dr. Yuta Wakayama (KDDI R&D Laboratories) for “DMD measurement of weakly-coupled few-mode fiber using low-coherence digital holography”
- OCS Young Researchers Award: Dr. Kengo Watanabe (Furukawa Electric) for “Development of MT type 8-multicore fiber connector”

Fig. 6 OCS award-winners: from left, Dr. K. Watanabe, Dr. Y. Wakayama, Mr. K. Fukuchi (presenter), Prof. Y. Kokubun, and Dr. Y. Matsuda.

5. Conclusion

We hope that all the participants in this symposium enjoyed the stimulating presentations and discussions on the future of ICT society and gained a new insight into optical communication as its backbone infrastructure. Finally, the OCS technical committee would like to thank all the speakers, participants, and exhibitors, for their contributions.

Report on 2015 Asian Wireless Power Transfer Workshop (AWPT2015)

Qiaowei Yuan
Chair of Technical Program Committee of AWPT2015
National Institute of Technology, Sendai College

1. Introduction

The first Asia international workshop on Wireless Power Transfer technology (AWPT2015) was successfully held at Tamkang University, Taiwan, from Dec.10 to 11, 2015. This workshop was sponsored and organized by the Technical Committee on Wireless Power Transfer (WPT) of the Institute of Electronics, Information and Communication Engineers (IEICE), and Department of Electrical Engineering of Tamkang University. The workshop was financially supported by IEICE communication society and Tamkang University.

2. Purpose of workshop

Technical Committee on WPT of IEICE was started as the first kind of committee from 2014 fiscal year with the greatly increasing of the researches and applications from WPT technology. The research on WPT has been involved into a lot of industry applications already, and it is definitely bringing our life more comfortable and convenient. AWPT2015 aimed on providing an international forum to exchange on the future trends or the latest advances of research and development on WPT technology. The workshop was also intended to enhance the friendship between the WPT researchers in Asia.

3. Organizing Committee

The Organizing committee of AWPT2015 was leaded by General Co-Chairs and strongly supported by Secretaries of the Technical Committee on WPT of IEICE and local committee. The organization has technical program committee, publication committee and local arrangement committee as well. These committee members are listed as the followings.

- General Co-Chairs
  Prof. Naoki Shinohara, Kyoto University, Japan
  Prof. Jen-Shiun Chiang, Tamkang University, Taiwan
- Secretaries
  Prof. Kenjiro Nishikawa, Kagoshima University, Japan
  Associate Prof. Masaya Tamura, Toyohashi University of Technology, Japan
  Assistant Prof. Takashi Hikage, Hokkaido University, Japan
  Assistant Prof. Tsunayuki Yamamoto, Yamaguchi University, Japan
- Technical Program Committee
  Chair: Prof. Qiaowei Yuan, National Institute of Technology, Sendai College, Japan
- Publication Committee
  Chair: Associate Prof. Hiroshi Hirayama, Nagoya Institute of Technology, Japan
  Assistant Prof. Tsunayuki Yamamoto, Yamaguchi University, Japan
- Local Arrangement Committee
  Chair: Prof. Yang-Han Lee, Tamkang University, Taiwan

Fig. 1 President Chang and Organizing Committee Members

4. Program and Activities

At the opening ceremony of AWPT2015, President Flora Chia-I Chang of Tamkang University gave her warmly welcome address to the workshop and the introduction of Tamkang University. Fig.1 is the photo of the committee members with President Chang.

AWPT2015 had 4 keynote talks,.One IEEE distinguished lecture and 6 oral sessions in 2-days program. All of them are presented in English. Keynote Speaker Dr. Ikoku Awai with Ryutech Corporation talked about Intriguing Wireless Power Transfer in Water[1]; Prof. Fumiyuki Adachi with Tohoku University focused on the energy problems of Small-cell Structured HetNet for future 5G Mobile Communications[1]; Prof. Ming-Heng Hsu with National Chung Hsing University introduced his transceiver and receiver chip design for A4WP system in high voltage 0.25mm CMOS technology and Prof. Ding-Bin Lin with National Taipei University of Technology talked about efficiency enhancement of the rectenna and the near field coupled antenna pair designs for WPT[1]. Prof. Takashi Ohira with

Fig. 2 Part Attendees of AWPT2015

Toyohashi University who is serving as an IEEE distinguished lecturer introduced his elegant formulations of three *kQ* product theorems for obtaining maximum wireless power transfer efficiency [2].

Six oral sessions in AWPT2015 had 31 papers, covering variety technologies from rectify circuits, near field, simulation to antenna. The average number of attendee per day was over 50 peopole. Fig. 2 is a gathering picture of part attendees. Fig. 3 is the look of the workshop.

Fig. 3 The look of the workshop

At the closing ceremony of AWPT2015, two best student's awards were selected for their excellent research works and nice presentations, they are

- Chia-Ying Yu (Tamkang Univ.), Po-Yuan Cheng (Lite-On), Chien-Ching Chiu, Po-Hsuan Huang (Tamkang Univ.), "Experimental Test for Wireless Power Transmission Using Different Receivers".
- Shun Maruyama, Qiang Chen (Tohoku Univ.), Qiaowei Yuan (Sendai College), "Efficiency Improvement of Near Field Wireless Power Transfer System by Parasitic Element Array".

Fig. 4 and Fig. 5 are the student winners of their best paper awards, Chia-Ying Yu from Tamkang University of Taiwan and Shun Maruyama from Tohoku University of Japan, respectively.

Fig.4 C. Yu (Tamkang Univ.)

Fig.5 S. Maruyama (Tohoku Univ.)

5. Conclusions

AWPT2015 was smoothly and successfully held in Taiwan, and achieved its goals with providing an international forum to exchange on the future trends or the latest advances of research and development on WPT technology. It has absolutely enhanced the friendship between the WPT researchers in Asia. More and more activities and corporations on WPT in Asian area will be expected in near future.

6. Acknowledge

The students of Tamkang University are highly appreciated for their passion, time and efforts to design the log of AWPT2015, prepare the arrangement of venue.

7. References

[1] http://www.ieice.org/~wpt/AWPT2015/Keynote.pdf
[2] http://www.ieice.org/~wpt/AWPT2015/IEEE_DL.pdf

Joint Conference on Satellite Communications (JC-SAT 2015) Report


Amane Miura, NICT
Katsuya Nakahira, NTT Network Innovation Laboratories

1. Introduction

The Joint Conference on Satellite Communications 2015 (JC-SAT 2015) was held on 7th and 8th of October 2015 at the Osaka University Nakanoshima Center in Osaka. The conference has been held annually with jointly organized by Technical Committee on Satellite Communications of IEICE (IEICE SAT) and Korea Society of Space Technology (KOSST) since 2000. It aims at information exchange and enhancing mutual understanding between satellite communication researchers and engineers both in Japan and Korea.

2. Program

Opening speeches were delivered by the organizing committee chairs, Dr. Morio Toyoshima, the chair of IEICE SAT (Fig. 1), and Dr. Ho-Jin Lee, the president of KOSST. The number of presented papers was 30 including a special invited talk, and 69 participants attended. The technical sessions was held as follows:

- Onboard Payload Technology 1
- Satellite System and Operation Technology
- Satellite Access Technology
- Antenna Technology 1
- Laser Technology for Satellite Communication
- Unmanned Aircraft System
- Onboard Payload Technology 2
- Satellite Technology and Application
- Antenna Technology 2
- Radiowave Propagation

3. Best Paper Awards

The best paper awards of JC-SAT were granted to the distinguished papers selected each from Japan and Korea. One was “Initial Overview of Satellite-ground Laser Communication Experiment using Small Optical TrAnsponder (SOTA)” by Yasushi Munemasa (Fig.2), Hideki Takenaka, Dimitar Kolev, Naohiko Iwakiri, Maki Akioka, Yoshisada Koyama, Hiroo Kunimori, Yoshihisa Takayama and Morio Toyoshima, and the other was “K-band Fully Reconfigurable Pseudo-Elliptic Bandpass Filter with a Negative Coupling Structure” by Seunggoo Nam, Boyoung Lee, Beyoungyoun Koh, Changsoo Kwak and Juseop Lee. A set of certificate was handed to each representative of the authors in the JC-SAT award ceremony.

4. Conclusion

A closing session was held in the end of day-2 with presentations of Dr. Ho-Jin Lee, and Dr. Takatoshi Sugiyama, who is the vice chair of IEICE SAT. They remarked the great success of the conference and noted a plan for the next conference in Korea in 2016.

Fig. 1 Opening speech from Dr. Morio Toyoshima of IEICE SAT

Fig. 2 The JC-SAT Award winner and the presenter

Fig. 3 JC-SAT 2015 participants

Report on the 7th Workshop of Internet Architecture in Narita, Japan

Toyokazu Akiyama
Expert Member, Technical Committee of Internet Architecture, IEICE

1. Introduction

The Technical Committee on Internet Architecture (TCIA) has held international workshops since 2009, aiming for further internationalization of IEICE. This year, TCIA successfully organized the 7th international workshop at Narita, Japan, on Nov. 12 and 13, 2015, as part of Asia Internet Technology Joint Symposium (AIT-JS) organized by JSPS 163rd Committee on Internet Technology (ITRC). This article is a brief report on the workshop activities.

2. Workshop Overview

Prof. Shimojo (Chair of ITRC) and Prof. Yoshida (Chair of TCIA) provided the opening speech to welcome the workshop. Then, we had two days programme including five invited talks, 22 technical talks and 6 poster presentations. First session is a conjunctive session organized by INI WG of ITRC targeting Disaster Response and ICT. 6 speakers provided interesting talks.

Two invited talks on first day were provided on e-Health, especially about digital health applications and emergency medicine;

- "Chiang Mai mHealth Project: The Use of 4G Internet Technology for Collecting Public Health and Diseases Big Data," by Prof. Ekkarat Boonchieng, Chiang Mai University, Thailand,
- "Role of ICT for Quality Improvement in Emergency Medicine," by Prof. Shoko Miyagawa, Keio University/CHORD-J, Japan.

Third invited talk on first day and two invited talks on second day were provided on Software Defined Network and Mobility Architecture;

- "An Efficient Network-based Mobility Support in Software Defined Networks," Prof. Sunyoung Han, Konkuk Univ., Korea,
- "Distributed Heterogeneous Mobile IP," Prof. Sinchai Kamolphiwong, Prince of Songkla Univ., Thailand,
- "SDN based Wireless Networks Management," Prof. Choong-Seon Hong, Kyung Hee University, Korea.

The remaining 16 technical talks were presented in the following 5 sessions, e-Health-1, e-Health-2, Network Architecture and Applications-1, Network Architecture and Applications-2 and Mobile Architecture and Applications. 12 of them were provided by the foreign students from Thailand and Taiwan. 6 posters were also presented in the poster session and 5 of them were presented by Japanese students. For those student presentations, the student research awards were presented at the end of two days fruitful workshop.

In addition to the technical talks and discussions, in the evening of the first day, participants enjoyed the banquet and Dr. Fujikawa's magic performance. After the workshop, part of participants also enjoyed Unaju and Naritasan Shinshoji Temple.

3. Conclusion

We believe that all participants were satisfied with the presentations, discussions and experience exchanging. TCIA thanks to all the speakers and participants for their efforts. TCIA also thanks for the generous support from ITRC.

Here, it should be mentioned that Prof. Jiann-Liang Chen, National Taiwan University of Science and Technology, Taiwan newly attended IA Workshop with his students. TCIA expresses sincere gratitude for his acceptance to host the next workshop.

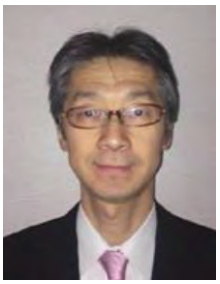
Next workshop is expected to be held at Taipei in Taiwan. Please visit the TCIA web page for more update information;

http://www.ieice.org/~ia/eng/index.php.

Fig. 1 Workshop participants

Fig. 2 Disaster Response and ICT session

Report on the 2015 NS English Session Awards and Award Ceremony



Atsushi Hiramatsu[†], NTT-AT Corp.
Hideki Tode[††], Osaka Prefecture University
Takuji Tachibana[†††], University of Fukui
Hideki Maeda[†††], NTT Corp.
Shohei Kamamura[††††], NTT Corp.

[†]Chair, [††]Vice Chair, [†††]Secretary, [††††]Assistant Secretary

1. Introduction

In the 2015 IEICE General Conference that was held on 10-13 March 2015, the IEICE Technical Committee on Network Systems (NS) provided the complete English Symposium Session entitled "Advanced Technologies in the Design, Management and Control for Future Innovative Communication Network." In this session, 60 papers were presented at a single track during whole of 4-days conference period [1], and the total number of participants was 159.

The NS committee selected recipients of NS English Session Awards among the 60 papers. The recipients won the awards at an award ceremony and presented the progress of their awarded paper as encouragement talk at an NS technical meeting in October 2015.

2. Award Ceremony

The award ceremony was held in the NS technical meeting at Akita University on 15 October 2015, and 35 participants attended the ceremony. Three distinguished papers won the NS English session awards, and recipients including substitute recipients received an award certificate and a plaque from NS technical committee chair (Fig. 1).

(For the past recipients, please see our English home page. URL: http://www.ieice.org/cs/ns/eng/index.html)

3. English Session Awards 2015

The abstracts of the three papers that won the 2015 NS English session awards are as follows.

Alexandre Manoury, Tomoji Tomuro, Yusuke Fukushima, and Ved P. Kafle: "Design and Implementation of Legacy Application Adaptation Tools for ID-based Communication" [2]

In the current IP-based communication, a host has to use its only one IP address for a communication session and the IP address is treated not only as the host locator in the network layer, but also as the host identifier in the transport and application layers. The host cannot utilize own multiple interfaces simultaneously (e.g. Wi-Fi, Ethernet, 4G cellular, and Bluetooth) connected to different access networks, i.e. multihoming, for

Fig. 1 English session award recipients with chair (Mr. Hiramatsu) and vice chair (Dr. Tode).

obtaining higher performance in heterogeneous mobile networking environments. To overcome this problem, we have developed an identity (ID)-based communication network architecture, which is called Heterogeneous Inclusion and Mobility Adaptation through Locator ID Separation (HIMALIS). In HIMALIS, each host uses a host identifier (HID), which is uniquely allocated by the network operator, to uniquely identify the host in the application and transport layers. It introduces an identity layer between the network and transport layers to map HIDs into locators and realize the ID-based communication. One important issue is to extend the benefits of the ID-based communication to both legacy and future applications. This paper first analyses the requirements of various use-case scenarios and proposes three distinct solutions to satisfy these requirements: (1) a native socket application programming interface (API) for developing optimal HIMALIS applications, (2) an API wrapping tool to adapt legacy applications for the ID-based communication without the application source code modifications, and (3) a SOCKS-based proxy tool to interwork between the IP-based communication and ID-based communication. Those solutions are implemented in user-space, and experiments are performed to demonstrate that each of these solutions offers great flexibility in terms of handling mobility and multihoming.

Tharinda Nishantha Vidanagama, Daisuke Arai, and Tomohiko Ogishi: "Performance under Varying Traffic Conditions of an M2M Gateway Selection Scheme for Smart Wireless Devices" [3]

The wearables and attachables made possible by innovative developments in short range wireless technologies such as Bluetooth Smart (Bluetooth V4.x) have effortlessly integrated into individual users and the industry for increased comfort, safety and efficiency. Allowing Machine-to-Machine (M2M) communication between these devices coupled with a connection to the Internet, enable a multitude of new services such as e-Health, connected consumers, city automation, smart transportation and smart grid etc. These lay the foundation for Internet of Things (IoT).

The typical short-range M2M device may require another capable M2M device such as a smartphone to act as a gateway for Internet connection to enable its full range of services. We investigate an architecture where the M2M gateways are provided by service providers or personal M2M gateways are sometimes used to provide Internet connectivity for M2M devices owned by other people. This architecture faces new challenges such as how to select the best among multiple available M2M gateways for preferred service and QoS. This paper investigates an M2M gateway selection method that considers higher service availability and available signal strength as QoS factors. This paper evaluates performance of the selection method by changing the number of active M2M devices which is considered as the congestion determinant, supported by data gathered at a real life experiment.

A congested situation was simulated by increasing the number of active M2M devices by extending the raw data from the experiment. Afterwards the bandwidth requirements and duration of the bandwidth requirements of the M2M devices were set randomly within their service time. The investigated M2M gateway selection method showed the least number of no-service M2M devices at any given time while the two compared methods showed higher number of M2M devices which could not obtain the services required.

Huong Pham-Thi and Takumi Miyoshi: "A Fair Bandwidth Allocation Method Based on Users' Degree of Relaxation" [4]

The spread of Internet and the development of mobile devices allow users easily enjoying many types of Internet services such as news, email services, social network, and even entertainment with audio and video. However, there are many challenges for network management and Internet service providers (ISPs) with the popularity of the Internet and its services. Resource management problem is a crucial issue since the network resource allocation method has to meet the users' requirements and still optimize the network performance. In previous studies, resource allocation methods are based on the fair objective quality of service (QoS) metrics to allocate the bandwidth. From the fair QoS viewpoint, all users will experience the same perceived quality of communication network in case of the same traditional network qualities or QoS metrics. However, the levels of users satisfaction may be different depending on various subjective factors such as users' situation, individual characteristics, and other psychological factors. Therefore, the objective metrics are difficult to guarantee the perceived quality of users. To overcome the limitation, an allocation method based on the viewpoint of the quality of experience (QoE) is introduced. From the users' viewpoint, this paper proposes a novel and computationally simple bandwidth allocation method in web browsing services. The proposal guarantees that all users experience the same perceived QoE. To achieve this aim, the proposed method firstly categorizes users into groups based on the statistical characteristics of their degree of relaxations. The proposed method then allocates the bandwidth to users according to their groups by applying Newton-Raphson method. By comparison with the traditional fair QoS method, the numerical results of the proposed method show a positive impact on the QoE of dissatisfied users.

4. Future Plans

In the 2016 IEICE General Conference at Kyushu University, the English Session entitled "Advanced Networking Technologies for Innovative Information Networks" will be held on 15-18 March. Many interesting studies on "network" and "service" including "wireless" and "optical" will be presented. Please attend the IEICE General Conference and enjoy the NS English session during four days.

5. Acknowledgements

We would like to give special thanks to Prof. Yoshiaki Tanaka due to his great contributions.

6. References

[1] Kazuya Tsukamoto, Takuji Tachibana, Shohei Kamamura, Masazumi Ota, Akira Shibata, Hideki Tode, and Atsushi Hiramatsu: "Report on NS English Session at 2015 IEICE General Conference -BS-3 Advanced Technologies in the Design, Management and Control for Future Innovative Communication Network-," *IEICE Global NewsLetter*, vol. 39, no. 2, p. 19, June 2015.

[2] Alexandre Manoury, Tomoji Tomuro, Yusuke Fukushima, and Ved P. Kafle: "Design and Implementation of Legacy Application Adaptation Tools for ID-based Communication," *IEICE General Conference*, BS-3-15, March 2015.

[3] Tharinda Nishantha Vidanagama, Daisuke Arai, and Tomohiko Ogishi: "Performance under Varying Traffic Conditions of an M2M Gateway Selection Scheme for Smart Wireless Devices," *IEICE General Conference*, BS-3-25, March 2015.

[4] Huong Pham-Thi and Takumi Miyoshi: "A Fair Bandwidth Allocation Method Based on Users' Degree of Relaxation," *IEICE General Conference*, BS-3-40, March 2015.

Report of SmartCom 2015


Takeo Fujii[1], Hiroshi Harada[2], Osamu Takyu[1], Hiroyuki Shiba[1], Keiichi Mizutani[2], Khanh Tran Gia[1], Hirokazu Sawada[2], Kenta Umebayashi[1] and Kentaro Ishizu[1]
[1] IEICE TC on Smart Radio
[2] IEICE TC on Short Range Wireless Communications

1. Introduction

SmartCom 2015 [1] was held in Tokyo on October 26-27, 2015 organized by IEICE Technical Committee on Smart Radio (TCSR) [2] and Technical Committee on Short Range Wireless Communications (TCSRW) [3]. It was the second SmartCom conference after the first conference of SmartCom was held in Singapore on October 30-31, 2014. SmartCom 2015 was organized by 37 presentations including 1 tutorial, 4 invited talks, 6 posters, 15 technical exhibits and 11 invited lectures. The number of participants was 60 on the first day and 111 on the second day.

The first day was kicked off with a welcome speech from Prof. Fujii, the chair of TCSR. Prof. Fujii introduced the historical background of SmartCom and its significance to go ahead on the enhancement of international relationship. A tutorial on spectrum measurement and modeling followed by speakers from EU and Japan. In the afternoon, an invited session was held where the speakers focused on the latest information on 5G and Internet of Things (IoT).

The second day started with poster presentations and technical exhibits. They were evaluated by committee members for SmartCom awards. The winner of the awards were cerebrated in the afternoon by the chairs of TCSR and TCSRW and all the participants. The last session was special talks on 5G and IoT given by academia and industry in EU and Japan

A series of SmartCom workshops was started from SmartCom 2014 [4] held in Singapore in October 2014. TCSR organized an organizing committee and had a long period of discussion and preparation to lead it to success, overcoming a number of technical issues to have a regular conference outside of Japan. Following its success, SmartCom 2015 was planned to invite participants to Japan, assuming that SmartCom 2016 will be again held outside of Japan.

Rest of the paper is organized as follows. Section 2 introduces historical background of SmartCom and overview of SmartCom 2014. Sections from 3 to 6 reports details of SmartCom 2015. Section 7 gives a plan of SmartCom 2016 to be held in Finland and section 8 conclude the paper.

2. Historical Background of SmartCom

2.1. Motivation to Launch

IEICE needs to be more activated to increase its connectivity with international organizations, enhance its presence and achieve more members. One of the TCSR's trials for it have been to invite key researchers from the world to TCSR's domestic regular conferences. This type of activities have been planned annually since year 2005, but limited in Japan only.

In the beginning of 2014, TCSR discussed that it is a good trial to have a regular conference outside of Japan. Focusing on Singapore where R&D on wireless communications is quite active, TCSR decided to have the first TCSR regular conference outside of Japan, named SmartCom 2014. SmartCom 2014 was expected to enhance the presence of IEICE and achieve new memberships from oversea and new area of industry. It is extremely attractive to invite outstanding researchers in the world to the organizing committee and jointly plan sessions.

2.2. SmartCom 2014 in Singapore

SmartCom 2014 was held at Institute for Infocomm Research (I2R) in Singapore on October 30-31, 2014. It was co-sponsored by I2R, IEEE VTS SG chapter and IEEE COMSOC Japan chapter.

SmartCom 2014 aimed to strengthen the cooperative relationship between Singapore and Japan setting TCSR and I2R as a core. Also, SmartCom 2014 was expected to be an infrastructure not only to promote discussion and information exchange, but also to generate cooperative research projects targeting practical research topics as well as academic topics.

The number of participants at SmartCom 2014 was 78 on the first day and 50 on the second day. It was largely beyond TCSR's expectation at its preparation stage. SmartCom 2014 acquired a number of new participants not only from Asian region, but also from Japan. It was a good surprise that so many students in Singapore participated in SmartCom2014. TCSR recorded the highest number of participants at SmartCom 2014 since TCSR was launched in 2005.

SmartCom 2014 was composed of keynote session, invited talk session and poster session including technical exhibition. Total number of presentation was 56, including 2 opening talks, 2 keynote talks, 13 invited talks, 30 poster presentations and 9 technical exhibitions. Also, 2 product exhibitions were provided from patron companies in Japan.

For SmartCom 2014, bylaws of SmartCom Awards were approved to give awards to best paper, best student paper and best technical exhibition.

Challenges of SmartCom 2014 include followings:

- Distribution of proceedings electrically using USB memory,
- Copyright management of technical reports,
- Efficient registration method via web sites, and
- Acquirement of external incomes from patrons to increase the services of conference.

Through these experiences, TCSR obtained a number of knowhow to organize IEICE regular conference oversea. These knowhow should be beneficial to discuss the future of IEICE.

After SmartCom 2014, TCSR discussed the future plan of SmartCom and decided to have SmartCom 2015 in Japan and SmartCom 2016 again outside of Japan. It was also realized that it is good to organize SmartCom jointly with \other technical committees.

3. Tutorial

An attracting tutorial session was held in morning, first day. The title is “Spectrum Measurement and Modeling for Spectrum Awareness in Cognitive Wireless Systems”, which is given by Prof. Kenta Umebayashi, Tokyo University of Agriculture and Technology, Japan, Dr. Janne Lehtomäki, University of Oulu, Finland, Dr. Miguel López-Benítez, University of Liverpool, England, and Dr. Samuli Tiiro, Tokyo University of Agriculture and Technology. They introduces the interesting concept for spectrum operation. It is “Two-Layer Smart Spectrum Access”. Spectrum sharing layer, which is first layer, takes the responsibility for avoiding the harmful interference to primary user and exploiting the frequency spectrum by secondary user. Spectrum awareness layer, which is second layer, is dedicated for spectrum measurement and obtaining/providing useful information to secondary user.

4. Invited Talks

The afternoon of the first day features invited talks on the topic of mmWave & IoT for 5G in which Japan and international experts are invited to share their views on global trend of latest wireless/cellular technologies.

Four invited talks were presented from the speakers shown in Fig. 1 in the afternoon on the first day. Firstly, Dr. Sumei Sun gave a presentation entitled “Design and Optimization of 5G Heterogeneous Networks”. In this presentation, she showed the use cases in 5G communications. And she also talked about design challenges in 5G heterogeneous networks. The smart resource sharing, seamless WiFi-cellular inter-working were key technologies to achieve a 5G heterogeneous networks.

Secondly, Prof. Seungwon Choi gave a presentation entitled “ETSI-Standard Architecture and Reconfiguration Process for Reconfigurable Mobile Devices”. He talked about the architecture of reconfigurable mobile device which is standardized in WG2 of technical committee reconfigurable radio system (TC-RRS) of ETSI.

The afternoon session of the first day of the event invited the specialist of IoT, M2M, and smart meters. They gave very interesting talks about technical trends in their technical fields as follows:

- IoT Use Cases of Social Infrastructure and Technical Standards (Dr. Taizo Kinoshita, Hitachi)
- Development trend of smart meter for gas infrastructure and its deployment in the future (Mr. Kentaro Sakamoto, Tokyo Gas.)

Fig. 1 Invited speakers
(Upper left: Dr. Sun, Upper right: Prof. Choi,
Bottom left: Dr. Kinoshita, Bottom right: Mr. Sakamoto).

5. Poster & Technical Exhibition

On the second day of the SmartCom2015, the morning session is featured by 15 technical exhibitions / demonstrations and 6 poster presentations on latest wireless technologies, e.g. 5G access & backhauling, mmWave, NFV, sensing/cognitive, sensor networks etc.

The all poster presentations and technical exhibitions were evaluated by several technical committee members of TCSR and TCSRW from the perspective that (1) Novelty and originality, (2) Technical content and scientific rigor, and (3) Quality of presentation. A best paper award and a best technical exhibition award were given to the paper getting the highest score among all posters and all technical exhibitions presented in SmartCom2015 respectively as follows:

- *SmartCom2015 Best Paper Award*: “Inter-carrier Interference Compensation Scheme for Millimeter Wave OFDM Systems,” Yuyuan Chang, Gia Khanh Tran, Kei Sakaguchi, Kiyomichi Araki (Tokyo Tech.).

- *SmartCom2015 Best Technical Exhibition Award*: "Multi-Beam Based Spatial Multiplexing for EHF-band Massive MIMO System and Evaluation by Outdoor Experimental Trial," Akihiro Okazaki, Hideki Morishige, Kenji Nakagawa, Hiroki Iura, Shigeru Uchida, Kazuaki Ishioka (Mitsubishi Electric Corp.), Tatsunori Obara, Satoshi Suyama, Yukihiko Okuyama (NTT DOCOMO), Atsushi Okamura (Mitsubishi Electric Corp.).

Snapshots of the poster / technical exhibition session and award ceremony are shown in Fig. 2 and 3, respectively.

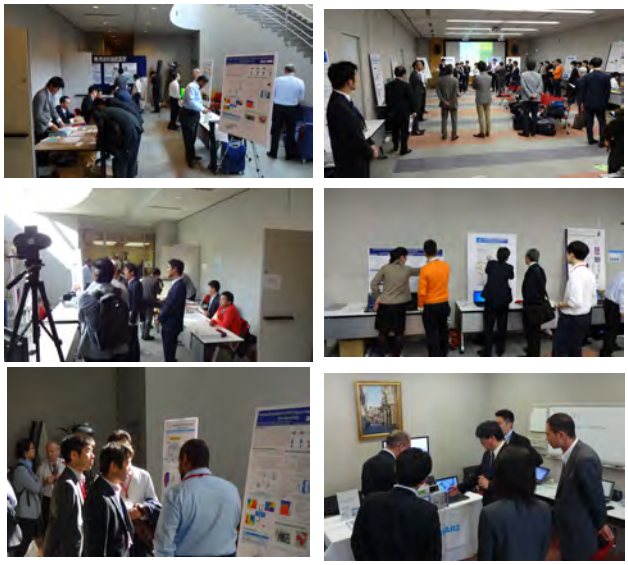


Fig. 2 Snapshots at poster session and technical exhibition.

Fig. 3 SmartCom 2015 Award Winners (Left: Prof. G. K. Tran (on Dr. Y. Chang's behalf), Right: Mr. A. Okazaki).

6. Special Sessions

The afternoon of the second day features invited lecture sessions on the topic of mmWave & IoT for 5G in which Japan and international experts are invited to share their views on global trend of latest wireless/cellular technologies. Snapshots at the special sessions are shown in Fig. 4.

Fig. 4 Snapshots at special sessions.

6.1. Millimeter Wave (mmW)

This session was divided into two sub-sessions. The first half featured 5G standardization activities worldwide with the four following invited talks:

- Gap Analysis at ITU-T IMT-2020 Focus Group and Outlook for Applicability of Advanced Wireless and Wired Technologies (Prof. Nakao, Tokyo Univ.)
- Phased Approach for 5G New RAT Standardization (Dr. Kishiyama, NTT Docomo)
- mmW on Your Hand in 5G (Prof. Sakaguchi, Tokyo Tech.)
- mmW WLAN System and Standardization for Next Generation Mobile Networks (Dr. Takahashi, Panasonic Corp.)

The second half focused on latest research activities of mmW communications especially for cellular networks, with the four following invited talks:

- 5G High Frequency Bands - From Channel Modeling to System Design (Dr. Wu, Intel USA)
- mmW Considerations in 5G Wireless Systems, System and Modeling Considerations (Mr. Wessel, Huawei Canada)
- BER and Service Area Measurement of Compact Range Communication with Radial Line Slot Antennas (Prof. Ando, Tokyo Tech.)
- mmMAGIC: mmW Based Mobile Radio Access Network for 5G Integrated Communications (Dr. Frascolla, Intel Germany)

6.2. Internet of Things (IoT)

IoT applications include home/industry automations, energy management, and many domains. Wireless systems to associate physical things including sensing device and actuated machine with information world will be required in the IoT era.
This session focused on wireless key technologies as well as applications, maintenance and standard, with the three following invited talks:

- High-Capacity and Wide-area Sensor Networks using 920-MHz band for IoT/M2M Services (Mr. Nobuaki Mochizuki, NTT)

- Controlling IoT device smartly using oneM2M specification (Dr. Shingo Fujimoto, Fujitsu Labs.)
- Wi-SUN Alliance - Promoting open interoperable industry standards for smart utility networks - (Mr. Junichi Iwana, Renesas Electronics, and Prof. Hiroshi Harada, Kyoto University)

7. SmartCom2016 in Oulu, Finland

The 4th SmartCom will be held at Oulu, Finland, on May 16-17, 2016. This workshop will be organized and co-sponsored by the technical committee on Smart Radio (SR), Radio Communication Systems (RCS), Reliable Communication and Control (RCC) of the Institute of Electronics, Information and Communication Engineers (IEICE) and Centre for Wireless Communications (CWC) at the University of Oulu. The general co-chairs of the workshop are Prof. Markku Juntti, University of Oulu, Finland and Prof. Takeo Fujii, The University of Electro-Communications, Japan.

The topics covered by SmartCom 2016 include, but not limited to, heterogeneous wireless networks, cognitive radio networks and dynamic spectrum management, wireless distributed network, MAC protocol and network management, hardware architecture and implementations. The workshop will consist of three sessions: keynote session, special session, and poster/exhibition session. We are looking for submission to the poster/exhibition session and the deadline for the submission is as follows.

- Registration of paper submission deadline: March 1st, 2016
- Camera-ready paper submission deadline: April 10th, 2016

Note that manuscripts will not be peer reviewed.

8. Conclusion

SmartCom has been accommodating more participants from academia and industry on wireless communications and let them tie up with each other through a series of SmartCom conferences held in various locations in the world including Japan. More IEICE technical committees are being involved with its organizing committee and extending the scope of discussion. SmartCom is now increasing its role as a hub of R&D. The organizing committee hopes that SmartCom is connecting the researchers in the world as well as giving positive feedback to the IEICE operation.

9. References

[1] SmartCom2015 website: http://www.ieice.org/cs/sr/smartcom/
[2] IEICE TCSR website: http://www.ieice.org/cs/sr/eng/
[3] IEICE TCSRW website: http://www.ieice.org/cs/srw/index_e.htm
[4] T. Fujii, et al., "Technical Committee on Smart Radio - A Challenge to New Frontiers and International Activities -," IEICE GLOBAL NEWSLETTER Vol. 39, No. 3, Sep. 2015.

Report on the 2015 CQ Basic Course Workshop

− Communication Quality in Wireless Networks −


Takefumi Hiraguri[†] and Daisuke Umehara[††]
Secretary of the Workshop
[†]Nippon Institute of Technology, [††]Kyoto Institute of Technology

1. Workshop and Venue

The 2015 CQ basic course workshop was held on October 30, 2015 at the Cultural Exchange Center of Osaka City University, Osaka, Japan. Organized by the IEICE Technical Committee on Communication Quality (CQ), the scope of which covers the broad range of research topics on communication quality, this workshop focused on the hot topics on communication quality in wireless networks.

2. Technical and Poster Sessions

The workshop featured a special invite session (2 talks, Fig. 1), two tutorial lecture sessions (2 talks, Fig. 2), and two poster sessions (16 posters, Fig. 3). Over 100 people, including students and researchers from many universities, institutes, and industries, participated in this workshop.

In the special invite session, we had two invited talks: “Evaluation of Mobile Communication Technology and Challenges for the 5th Generation Mobile Communications Networks” presented by Prof. Fumiyuki Adachi (Tohoku University), and “Expectation to a Smart Radio Communication System” presented by Prof. Iwao Sasase (Keio University). Prof. Adachi introduced the methods of evaluation of mobile communications technology employed over the past 35 years and the technical issues related to 5G. Prof. Sasase introduced the expectation towards a smart radio communications system to achieve a more advanced and comfortable society.

The two following tutorial lectures were delivered: “Evaluation and Measurement for Quality of Experience (QoE)” by Dr. Akira Takahashi (NTT), and “The Basic Techniques of MIMO Transmission and the Communication Efficiency in the Wireless LAN Networks” by Prof. Kentaro Nishimori (Niigata University) and Prof. Takefumi Hiraguri (Nippon Institute of Technology). These lectures covered the core concepts related to communications quality that are discussed in excellent textbooks written by the speakers on the topics.

During the poster session, all the attendees had active discussions in a friendly atmosphere. The best workshop poster awards were earned by Mr. Takuya Kamenosono (Kyoto University) and Mr. Ryusuke Imai (Keio University). In addition, the workshop poster awards were earned by Mr. Isamu Shitra (Nippon Institute of Technology) and Mr. Yoshihiro Minematsu (Nagoya University).

3. Conclusion

The 2015 CQ basic course workshop on topics related to QoE and Wireless CQ was successfully conducted. We thank all the speakers, participants, committee members, and staffs for their contribution and support. The next CQ basic course workshop will be held in autumn 2016.

4. Reference

[1] The CQ basic course workshop website: http://www.ieice.org/cs/cq/jpn/cq_workshop/

Fig. 1 Special invite session (Prof. Sasase)

Fig. 2 Tutorial lecture

Fig. 3 Poster session

Report on the 4th International Conference on Renewable Energy and Applications (ICRERA2015)

Tadashi Suetsugu
Fukuoka University

1. Introduction

The 4th International Conference on Renewable Energy and Applications (ICRERA2015) was held in Palermo, Italy from November 22 to November 25, 2015. ICRERA is the annual world-class technical forum presenting the latest research topics in the renewable energy technologies, and their applications.

2. Overview

The conference program included five keynote addresses, 40 technical sessions, 10 special sessions, and 5 tutorials on state of art and emerging topics.

The main sponsor of ICRERA conference was the International Journal of Renewable Energy (IJRER). The conference was also technically co-sponsored by IEEE Industrial Electronics Society (IEEE IES), IEEE Industry Applications Society (IEEE IAS), IEEE Power Electronics Society (IEEE PELS), Taiwan Power Electronics Association (TaiPEA), the Korean Institute of Power Electronics (KIPE), the Institute of Electrical Engineers of Japan (IEEJ), and the Institute of Electronics, Information and Communication Engineers (IEICE). It was also supported by Universita Degli Studi Di Palermo, Italy, Gazi University, Turkey and Nagasaki University, Japan. From the next ICRERA, IEEE PELS will join as one of main sponsor of this conference.

3. Opening Ceremony and Keynote Speeches

The conference was commenced by welcome address by General Chair, Prof. Rosario Miceli, General co-chairs Prof. Ilhami Colak and Prof. Fujio Kurokawa at a historic building Palazzo Chiaramonte-Steri. After the opening, two high-profile keynote speakers, Prof. Dong Tan and Prof. Adel Nasiri addressed the variety of topics on energy technologies.

Three keynote speakers, Prof. Francesco Profumo, Prof. Javier Uceda, and Prof. Frede Blaabjerg addressed keynote speech in the morning of Nov. 24.

4. Technical Program

The Technical Program Committee selected papers for presentation by careful peer review process. Finally 305 papers were presented during the conference. Among them 240 oral presentations were organized in 48 Technical Sessions. 65 papers were presented in poster session; poster presentations were organized in the afternoon of Nov. 23 and Nov. 24.

Fig. 1 Opening Ceremony

Fig. 2 Keynote Speaker Prof. Frede Blaabjerg

Each session was mostly well-attended and productive discussions were facilitated.

5. Conclusions

Since 2012, ICRERA has been the forum for researchers and engineers in renewable energy.

Total 305 papers were presented at ICRERA2015 including exhibitor from 53 countries and regions, ICRERA2015 successfully provided an excellent venue and facilitated the research collaboration in renewable energy technologies.

Next year, ICRERA2016 will be held in Birmingham, UK on November 20-23, 2016.

Report on 2015 International Symposium on Antennas and Propagation (ISAP2015)

Masaharu Takahashi
Chiba University, ISAP JSC Secretariat

1. ISAP2015

2015 International Symposium on Antennas and Propagation (ISAP2015) was held at the Wrest Point Hotel, Hobart, Tasmania, Australia from November 9th to 12th. This was the ninth ISAP outside Japan since the symposium started to be held in Asia-Pacific region every year. It has been organized by a number of organizations including University of Technology Sydney (UTS), CSIRO, University of Adelaide, Macquarie University, University of Queensland, Xidian University through its National Laboratory on Antennas and Microwave, and Information Collaborative Awareness Technology Innovation Centre, as well as Academic Services. This symposium was technically cosponsored by 2 academic organizations including the IEICE Communications Society and IEEE AP Society. In addition, it was also sponsored by 2 companies.

As General Chairs, Prof. Y. Jay Guo (UTS), and as Technical Program Committee (TPC) Co-chairs, Prof. Christophe Fumeaux (University of Adelaide), Prof. Ananda Mohan Sanagavarapu (UTS), Prof. Karu Esselle (Macquarie University) and Prof. Amin Abbosh (The University of Queensland) served.

The size of the symposium reached the top level of former ISAP symposia as shown in Table 1. Papers were submitted from 35 countries/regions not only in Asia- Pacific but all over the world. Table 2 shows the ranking countries/regions with accepted papers number of five or more. Approximately 119 reviewers including TPC members nominated by international review system contributed energetically multiple-review work in a limited time and supported TPC.

The first day, November 9th, five invited lecturers' workshops were held. The ISAP International Steering Committee (ISC) Meeting was held in the evening. For more information referred to later.

After the second day, four keynote speeches, 54 technical oral sessions at 5 conference rooms were presented in three days from November 10th to 12th.

The keynote speeches were as follows,

- Dr. Alex Zelinsky (Defence Science and Technology Organization, Australia), "Antenna and Wireless Technologies for Safeguarding Australia"
- Prof. Koichi Ito (Chiba University, Japan), "Recent Medical Applications of Antennas"

Table 1 Major statistics

Papers Submitted	359
Papers Accepted	303

Table 2 Number of accepted papers

Japan	95
Australia	66
China	40
Korea	19
Malaysia	11
Sweden	8
USA	8
Denmark	6
Canada	5
Germany	5
India	5
Poland	5

Fig. 1 Keynote speech by Dr. Zelinsky.

Fig. 2 Winners of the Student Paper Contest with Prof. Ando, Chair of ISC and Prof. Guo, Chair of ISAP2015.

- Prof. Yahya Rahmat-Samii (University of California, Los Angeles, USA), "The Mesmerizing Evolution of Reflector Antennas in Diverse Applications: A Passage from the Ancient Past to the Renaissance and the Present"
- Dr. Peter de Maagt, (European Space Agency, The Netherlands), "Antennas and Quasi-optics For Space Terahertz Instrumentation"

Figure 1 is the photo of the keynote speech by Dr. Zelinsky.

Student paper contest was also held on the symposium. The four winners were awarded at the banquet on November 11th as shown in Fig. 2.

2. ISAP International Steering Committee Meeting

The ISC was established during ISAP2006 with 9 countries/regions. The mission of the committee is planning future ISAP and establishing operation rules to steer the symposia smoothly using international cooperation. Now the number has reached 12, Australia, China, Hong Kong, India, Japan, Korea, Macau, Malaysia, Singapore, Taiwan, Thailand, and Indonesia.

The operation of the symposium was discussed and future ISAP venue has been decided in the meeting. The ISAP-ISC has decided that the venue of ISAP2018 will be Busan, Korea in this meeting. Thus the venues up to 2018 have been decided, Okinawa, Japan in 2016, and Phuket, Thailand in 2017.

The chair of ISC came to be chosen in the election from this meeting. Prof. Ando was elected as ISAP ISC chair of the next two years of 2016 and 2017.

Figure 3 shows photo of the ISC Member.

3. ISAP Archives

ISAP ISC also set up ISAP Archives recording all papers presented at the previous ISAP. At this moment all papers from the first ISAP in 1971 to ISAP 2014 have been digitized and online, as a result everybody in the world AP community can access ISAP papers with free of charge. The archive is updated every year. This service will respond to expectations of AP specialists in the world and enhance motivations especially for Asian people to submit papers.

The URL of the ISAP Archives is "http://ap-s.ei.tuat.ac.jp/isapx/" and the top page is shown in Fig. 4. The site can also be reached through the web site of the IEICE Knowledge Discovery, I-Scover (http://i-scover.ieice.org/). The papers of the latest ISAP will be archived almost a half year later after the ISAP. The papers of ISAP2015 will appear in the ISAP Archives in June, 2016. In addition to the ISAP Archives, papers of recent ISAPs have also been included in IEEE Xplore.

4. Conclusion

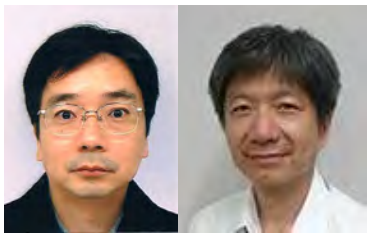
ISAP2015 provided to contributors and participants an academic and friendship atmosphere for exchanging advances in AP research and strengthening relationship. Many young students also had a chance to discuss with the experts in their fields. The upcoming ISAP2016 will be held in Ginowan, Okinawa, Japan, from October 24th to 28th, 2016. Deadline for paper submission is April 22th, 2016. Please see the details in the ISAP2016 Web site shown in Fig.5 (http://isap2016.org/) and also Call for Paper shown at the end of this newsletter.

Fig. 3 ISC Member.

Fig. 4 ISAP Archives Web site (http://ap-s.ei.tuat.ac.jp/isapx/).

Fig. 5 ISAP2016 Web site (http://isap2016.org/).

Report on the IEEE 37th International Telecommunications Energy Conference (INTELEC2015)



Tadashi Suetsugu and Nobuhiko Yamashita
INTELEC2015 Secretary

1. Introduction

IEEE 37th International Telecommunications Energy Conference (INTELEC) was held in Osaka, Japan from October 18 to October 22, 2015. INTELEC is the annual world-class technical forum presenting the latest in communications power systems, energy storage and energy conversion.

2. Overview

With the theme "Smart Green Energy for Future ICT", the conference program included three keynote addresses, 34 technical sessions, and special sessions on new and emerging topics.

It was technically sponsored by IEEE Power Electronics Society. It was also supported by The Institute of Electronics, Information and Communication Engineers, The Institute of Electrical Engineers of Japan, The Illuminating Engineering Institute of Japan, The Institute of Electrical Installation Engineers of Japan, IEEE PELS Japan Joint Chapter, IEEE PELS Fukuoka Chapter, The Korean Institute of Electrical Engineers, The Korean Institution of Power Electronics, and International Journal of Renewable Energy Research.

3. Opening Ceremony and Keynote Speeches

The conference was commenced by welcome address by General Chair, Mr. Kiyoshi Tsutsui. After the opening, three high-profile speakers addressed the variety of topics on energy technologies.

The first address was given by Mr. Hiromichi Shinohara, senior executive vice president of NTT. The second address was given by Mr. Alex McEachern, Fellow of IEEE, and President of Power Standards Lab. The third address was given by Prof. Dr. Johann W. Kolar, Fellow of IEEE, Director, Power Electronic Systems Laboratory, Department of Information Technology and Electrical Engineering.

4. Technical and Poster Sessions

The Technical Program Committee received 304 paper submissions from 27 countries and regions, and selected 226 papers for presentation by careful paper review process. The peer-review was completed by more than 100 professionals. Finally 212 papers were presented during the conference. 135 oral presentations were organized in 34 Technical Sessions. 77 papers were presented in poster session; poster presentations were organized in the morning of Oct. 21. Each session

Fig. 1 Keynote speech presented by Mr. Hiromichi Shinohara

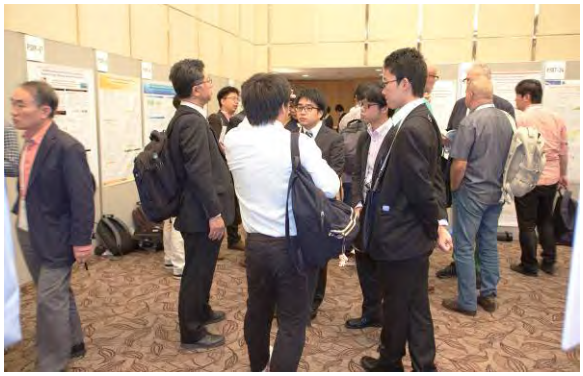


Fig. 2 Poster Session

was mostly well-attended and productive discussions were facilitated.

5. Other Sessions

The conference had 4 Tutorials, 2 Commercial Sessions, 4 Organized Sessions, and 2 Workshops.

Exhibition is also held during the conference, 33 companies and IEEE had booths. Participant of the conference had able to contact principal companies and get information.

6. Best Paper Award

Two awards were held at INTELEC 2015. Excellent Presentation Award is selected from poster presentations and winners were commended in a Banquet. Outstanding Paper Award is selected form oral presentations and winners were commended in the closing session. We are pleased to announce the awardees. Congratulations!

[Excellent Presentation Award]
1st PRIZE
"A Feasibility Study on a Regional Energy Business"
Authors: Midori Nonogaki, Ken Ozeki, Tadatoshi Babasaki, Keiichi Hirose, and Nobuyuki Yoshizawa
NTT FACILITIES, INC., Japan

2nd PRIZE
"Advanced Lead Carbon Batteries for Partial State of Charge Operation in Stationary Applications"
Authors: Jon L. Anderson and Jay Frankhouser
C&D Technologies Inc., United States
"A Novel Simple Technology for Power Switching in HVDC System"
Authors: Shinya Watanabe, Yuta Sagara, Shota Yamane, Seiji Aso, Kentaro Kokura, Seiji Ikeda, and Mitsugi Mori
Mitsubishi Electric Corporation, Japan

3rd PRIZE
"A High-Precision Constant Current Primary Side Controller with Inductance Compensation"
Authors: Yang Xu, Changyuan Chang, Bin Bian, Yao Chen, and Junjie Hu
Southeast University, China
"A 160-kW High-Efficiency Photovoltaic Inverter with Paralleled SiC-MOSFET Modules for Large-Scale Solar Power"
Authors: Ayumu Hatanaka, Hiroshi Kageyama, and Toru Masuda
Hitachi, Ltd., Japan
"Analysis of GaN HEMT-Based Phase Shifted Full Bridge DC-DC Converter"
Authors: Dong-Myoung Joo1, Byoung-Kuk Lee1, Dong-Sik Kim2, Jong-Soo Kim2, and Hee-Jun Kim3
1Sungkyunkwan University, Republic of Korea, 2Daejin University, Republic of Korea, 3Hanyang University, Republic of Korea

[Outstanding Paper Award]
1st PRIZE
"Power Control of a Bi-Directional AC/DC Rectifier Used for Telecom Backup Systems"
Authors: Sajjad M. Kaviri, Majid Pahlevani, Bahador Mohammadpour, Praveen Jain, and Alireza Bakhshai
Queen's University, Canada

2nd PRIZE
"The Communication Power System with V2C Adaptive Control Method"
Authors: Haoyu Li, Yuan Liu, Lei Zhao, and Zhenwei Li
Harbin Institute of Technology, China
"Low Phase-to-Phase-Impedance Busbar for Modular Power Converter System"
Authors: Hiroshi Kamizuma, Yukio Hattori, Daisuke Matsumoto, Akira Mima, Tetsufumi Kawashima, Yuichi Mabuchi, and Tomonori Ichikawa
Hitachi, Ltd., Japan

3rd PRIZE
"Development of Fuses for High Voltage Direct Current Power Systems"
Authors: Yuji Yoshida and Yosuke Furuya
Daito Communication Apparatus Co., Ltd., Japan
"Model Based Control of Modified Four-Phase Interleaved Boost Converter for Fuel Cell Power Source for Mobile Based Station"
Authors: Pongsiri Mungporn1, Nitchamon Poonnoi1, Suwat Sikkabut1, Chainarin Ekkaravarodome1, Phatiphat Thounthong1, Nicu Bizon2, Melika Hinaje3, Serge Pierfederici3, and Bernard Davat3
1King Mongkut's University of Technology North Bangkok, Thailand, 2Univ. Pitesti, Romania, 3GREEN, Université de Lorraine, France
"Microgrids for Base Stations: Renewable Energy Prediction and Battery Bank Management for Effective State of Charge Control"
Authors: Youngsung Kwon1, Alexis Kwasinski2, and Andres Kwasinski 3
1University of Texas at Austin, USA, 2University of Pittsburgh, USA, 3Rochester Institute of Technology, USA
"DC Capacitor Voltage Regulation of Modular Multilevel Cascade Converter (MMCC-SSBC) for DC-Powered Data Center"
Authors: Shota Oki and Hiroaki Kakigano
Ritsumeikan University, Japan

7. Conclusion

Since 1978, INTELEC has been the forum for researchers and engineers in communication energy systems.

About 700 persons attended INTELEC2015 including exhibitor from 32 countries and regions, INTELEC2015 successfully provided an excellent venue and facilitated the research collaboration in telecommunication energy technologies.

Next year, INTELEC2016 will be held in Austin, Texas, USA on October 23-27, 2016.

EIWAC2015 - Global Harmonization for Future Sky

Shigeru Ozeki and Shun-ichi Futatsumori
Electronic Navigation Research Institute

1. Introduction

The fourth ENRI International Workshop on ATM/CNS 2015 (EIWAC 2015) was held at KFC Hall & Rooms, Ryogoku, Tokyo, Japan from November 17th to 19th, 2015, in cooperation of communication society of IEICE. After successful meetings in 2009, 2010 and 2013, ENRI organized this conference with its theme as "Global Harmonization for Future Sky" [1].

This workshop focused on the research and development of modern air traffic management (ATM) and its enabling technology in Communication, Navigation and Surveillance (CNS). This workshop will contribute to the global harmonization of all air-transportation services by providing the forum, especially between the Asia & Pacific region and two other focal points of air traffic, i.e., European and American continents.

Leading experts from research, industry and academia met at this workshop to share their ideas and their approaches. 744 participants from 17 countries enjoyed 13 keynote speeches, 55 oral presentations and 6 posters. 11 exhibitions were also triggered discussions among participants.

ENRI thanks following institutes for their support to EIWAC2015. The workshop is kindly promoted by many international bodies who are working on international standards on ATM and CNS, i.e., International Civil Aviation Organization (ICAO), EUROCAE and RTCA. Air navigation service providers like as Japan Civil Aviation Bureau (JCAB) and French civil aviation authority (DGAC/DSNA) also supported and interested. Academic institutes like Japan Society for Aeronautical and Space, Science (JSASS), the Japan Institute of Navigation (JIN), the Institute of Positioning, Navigation and Timing (IPNTJ) and the Institute of Electrical Engineers Japan (IEEJ) kindly coordinated to avoid conflicts of schedules among many events or conferences. Logos from Research institutes and Universities such as Korea Aerospace Research Institute (KARI), Korea Aerospace University (KAU), French Civil Aviation University (ENAC), NASA and Japan Aerospace Exploration Agency (JAXA) are also found with indicating their kind supports to this workshop.

In preparation for EIWAC2015, the international members for technical program committee, Prof. Vu Duong Nguyen (VNU - Ho Chi Minh), Mr. Jean-Marc Loscos (DSNA, French Air Navigation Service Provider), and Mr. William C. Johnson (NASA) made great contributions to assign papers for technical session with considering the activation of discussion on site.

Fig. 1 Keynote speech at the KFC hall

2. Plenary Sessions

EIWAC2015 started with the opening address by Dr. Kazuo Yamamoto, the president of ENRI. The plenary sessions are organized with inviting speakers to provide a forum for exchanging opinions for future air traffic managements and to introduce the background information of technical requirements to researchers.

At first, the presentation on the policy for harmonized implementation of ATM/CNS introduced basic motivations to conduct R&Ds (Fig. 1). Mr. Hitoshi Ishizaki, Director of Air Navigation Services Department, Japan Civil Aviation Bureau presented on the future plan of JCAB for renovation of ATM/CNS systems. Mr. Richard Macfarlane, Deputy Director of Air Navigation Bureau, International Civil Aviation Organization (ICAO/ANB) provided updates on the Global Air Navigation Plan, GANP, and its road map called Aviation System Brock Upgrades, ASBUs, to bring this new vision into operational reality. He emphasized the importance of synchronization of R&D projects to ASBUs to apply those results practically and timely.

Mr. Michael Standar (SESAR-JU) and Mr. Philippe Merlo (EUROCONTROL) had their presentation to introduce their cooperation for harmonized modernization of systems for European airspace.

Mr. Neil Planzer (Boeing) and Mr. Chris Metts had joint presentation to explain their perspective on future aircraft which will be connected to network system

under the System Wide Information Managements, SWIM. On the other hand, Mr. Blair Cowles (IATA) introduces the operator's point of view with indicating the importance of cost effectiveness and long term compatibility of CNS systems which will support smooth operation through out of the aircraft life time as long as 20 years or more. the activities to standardize aeronautical radio systems with long term perspective.

Mr. Edward Bolton Jr. (Federal Aviation Administration), Mr. Akbar Sultan (NASA) and Dr. Kazuo Yamamoto (ENRI) reported on the status of R&D projects. Mr. Akbar Sultan supported the extension of ASBUs by ICAO with indicating the needs for more time for R&D phase to enhance airport operation capabilities by synchronizing air traffic flows of arrival, airport surface and departure.

Participants enjoyed the chance for discussions with these opinion leaders after each presentation.

3. Invited Talks on R&D for Global Harmonization

Mr. Patrick Souchu (DSNA) presented the phase change from R&D to harmonized implementation of ATM/CNS systems in Europe. Mr. Mohamed Faisal (ATMRI) introduces the activities of new research institute, ATMRI in Singapore, and their needs for global collaborations based on the consistency in Asian region. Dr. Yasuhiro Koshioka (JAXA) introduces the results and outcomes from DREAMS project and his vision to the next steps.

4. Special Session: Asian R&D Interchanges

EIWAC is a unique workshop in Asia/Pacific region focused on ATM/CNS area. It is a good chance to exchange among researchers in this area. ENRI invited presenters from Korea, Thailand, China and Japan. Each presenter introduced R&D activities in each research institutes with expecting collaborations.

5. Special Session: MIC Projects

In the "MIC Projects: New Technology to Expand Radio Wave Resources" session, there are 5 presentations. These papers discussed mainly new research results of the projects which are financially supported by the Ministry of Internal Affairs and Communications of Japan.

The research group of National Institute of Information and Communications Technology and Waseda University presented the paper entitled "High-speed mobile backhaul links using fiber-wireless technologies". This is aiming to achieve high-speed data link between the moving objects and the ground base stations. In addition, the researcher form the KDDI R&D laboratory presented paper entitled "Expansion of millimeter wave communication area utilizing effective reflection paths". Then, the researcher form the Hitachi Limited presented paper entitled "Experimental study of photonic based radar for FOD detection systems using 90GHz-band". The purpose of the radar system is detecting the small foreign object debris on the airport surface using the 90 GHz millimeter-wave radar system. After that, the researcher form the Central Research Institute of Electric Power Industry presented paper entitled "Photonic frequency conversion technique for millimeter wave radio-over-fiber access network". Finally, the researchers form the Osaka University presented paper entitled "Antenna-coupled-electrode electro-optic modulators for millimeter-wave frequency ranges".

6. Special Session: Space Weather and GNSS

This session focused on the effect of ionospheric propagation on the GNSS performance. Six researchers from Thailand, Australia and Japan had their presentation.

ENRI thanks academic institutes for their efforts to avoid the conflict with other academic events in schedule for this session.

Fig. 2 Exchanges of researchers at reception

7. Technical Sessions

Various themes are set to discuss in each session. For example, "Surveillance and D&A for UAS", "Human performance", "Datalink and information managements", "Arrival managements", "ATM modeling and weather", "trajectory based operation", "Datalink" and so on are discussed.

8. What Is Next?

EIWAC2015 provided a forum to discuss on ATM/CNS and a chance to exchange with opinion leaders in future civil aviation. It is very rare chance in the Asia/Pacific region. ENRI is now working on papers to edit a book for selected papers of EIWAC2015 like as last time, EIWAC2013 [2].

The next EIWAC will be scheduled in 2017 or so with hoping that our activity will contribute for providing the chance of researcher's exchanges in air traffic management, communication, navigation and surveillance related studies.

9. References

[1] ENRI, "Abstract of EIWAC2015 Presentations," November, 2015.

[2] ENRI ed., "Air Traffic Management and Systems - Selected Papers of the 3rd ENRI International Workshop on ATM/CNS (EIWAC2013)", · ISBN 978-4-431-54474-6, Springer Japan, 2014.

Report on The 21st Asia Pacific Conference on Communications (APCC2015)

Kohei Mizuno
NTT Network Innovation Laboratories, NTT Corporation

1. Introduction

The 21st Asia-Pacific Conference on Communications (APCC2015) was held October 14-16, 2015, in Kyoto, Japan. With the theme “Innovating Communications Networks toward a Sustainable and Smart Society”, the conference program included two keynote speeches, 31 technical sessions, and two special sessions on new and emerging topics. Sponsored by IEICE Communications Society (IEICE-CS), and co-sponsored by the IEEE Communications Society, the China Institute of Communications (CIC), and the Korea Information and Communications Society (KICS), it was attended by 218 researchers and engineers mostly from the Asia-Pacific region.

Fig. 1 Kyoto University Clock Tower Centennial Hall

2. Opening Ceremony and Keynote Speeches

The conference started with welcoming addresses from the General Co-Chair, Keio University Prof. Iwao Sasase, and from Kyoto University Prof. Susumu Yoshida, and with congratulatory addresses from Prof. Masahiro Umehira, President of the IEICE Communications Society, Prof. Byeong Gi Lee, former President of IEEE Comsoc from Seoul National University, and Mr. Zhang Xinsheng, Vice President & Secretary of CIC. Following the congratulatory addresses, Technical Program Committee (TPC) statistics were reported by Dr. Atsushi Murase, TPC Co-Chair of APCC2015.

After the opening, two prominent speakers addressed topics on 5G mobile networks.

The first address was given by Mr. Seizo Onoe, CTO and Executive Vice President at NTT DOCOMO INC. Entitled “Evolution from the past to the future beyond 5G”, the address focused on the current status of LTE/LTE-Advanced, and on 5G technologies, spectra, use cases, launch timing, and technology divergence trends.

Fig. 2 Mr. Seizo Onoe delivering his address

The following speaker, Dr. Kyungwhoon Cheun, Executive Vice President, Digital Media & Communication R&D Center, Samsung Electronics Co., gave a presentation on "The vision, requirements, and key technologies envisaged for 5G mobile communications in 2020 and beyond". In it he talked about key points ranging from clean air technologies and network designs to services, along with recent R&D achievements demonstrating the feasibility of proposed technologies and showing the bright future prospects for 5G.

3. Technical Sessions and Banquet

The TPC received 256 paper submissions from 23 counties and regions, and selected 140 papers for presentation through a careful peer review process conducted by more than 80 professionals. Oral presentations on the papers were made in 26 sessions. The sessions were mostly well-attended and resulted in many productive discussions. A “Latest Results Workshop” comprising four oral sessions and one poster session was also organized and held.

A banquet was held at the Kyoto Brighton Hotel on October 16, and “Best Paper Award” presentations were made.

Recipients of the awards are selected each year by the Award Committee established in the APCC Steering Committee. The committee members conducted another peer review of the papers getting the nine highest scores, in which technical aspects were

considered as well as the papers' possible impact in the relevant fields. By averaging the score given by the committee and the original score, the following four papers were selected.

1) "VNode Infrastructure Enhancement – Deeply Programmable Network Virtualization," authored by:
Kazuhisa Yamada (NTT)
Yasusi Kanada (Hitachi Corporation)
Koichiro Amemiya (FUJITSU LIMITED)
Akihiro Nakao (University of Tokyo)
Yoshinori Saida (NEC Corporation)

Fig. 3 Best Paper Award recipient: Mr. Yamada

2) "Link-Adaptable Vector-Perturbation ZFBF Precoder for Multi-Point 3D-Beamformers," authored by:
Masaaki Fujii (Samsung R&D Institute Japan)

Fig. 4 Best Paper Award recipient: Dr. Fujii

3) "Demonstration of the Improvement of Transmission Distance Using Multiple State Trellis Coded Optical Modulation," authored by:
Emmanuel Le Taillandier de Gabory (NEC Corporation)
Tatsuya Nakamura (NEC Corporation)
Hidemi Noguchi (NEC Corporation)
Wakako Maeda (NEC Corporation)
Sadao Fujita (NEC Corporation)
Jun'ichi Abe (NEC Corporation)
Kiyoshi Fukuchi (NEC Corporation)

Fig. 5 Best Paper Award recipient: Mr. Gabory

4) "Packet Classification with Multiple Decision Tree," authored by:
Pi-Chung Wang (National Chung Hsing University)

Fig. 6 Best Paper Award recipient: Prof. Wang

At the banquet, two "maiko-sans" appeared as surprise guests and performed traditional Japanese dances.

4. Conclusion

Since 1993, APCC has been the forum for researchers and engineers in the Asia-Pacific region to present and discuss topics related to advanced information and communication technologies and services, while at the same time, opening the door to the world. APCC2015 successfully provided an excellent venue and facilitated research collaboration in the Asia-Pacific region.

The next such forum, APCC2016, will be held August 25-27, 2016 in Yogyakarta, Indonesia.

IEICE-CS Related Conferences Calendar

Date	Conference Name	Location	Note
24 Oct. - 28 Oct. 2016	International Symposium on Antennas and Propagation (**ISAP2016**)	Okinawa, Japan	Submission deadline: 22 Apr. 2016
5 Jul. – 8 Jul. 2016	The 8th International Conference on Ubiquitous and Future Networks 2016 (**ICUFN2016**)	Vienna, Austria	Submission deadline: Closed
3 Jul. - 7 Jul. 2016	21st Optoelectronics and Communications Conference / International Conference on Photonics in Switching 2016 (**OECC/PS 2016**)	Niigata Japan	Submission deadline: Closed
14 Jun. - 17 Jun. 2016	2016 IEEE 17th International Conference on High Performance Switching and Routing (**IEEE HPSR2016**)	Yokohama Japan	Submission deadline: Closed
25 Apr. 2016	Eighth IEEE/IFIP International Workshop on Management of the Future Internet (**ManFI2016**)	Istanbul, Turkey	To be held **soon**
3 Apr. – 6 Apr. 2016	The 2nd International Workshop on Smart Spectrum (**IWSS2016**)	Doha, Qatar	To be held **soon**
13 Jan. – 15. Jan. 2016	The 30th International Conference on Information Networking (**ICOIN2016**)	Kota Kinabalu, Malaysia	Done
22 Nov. – 25 Nov. 2015	4th International Conference on Renewable Energy Research and Applications (**ICRERA2015**)	Palermo, Italy	**Reported** on this issue
17 Nov. - 19 Nov. 2015	The 4th ENRI International Workshop on ATM/CNS (**EIWAC2015**)	Tokyo, Japan	**Reported** on this issue
9 Nov. - 12 Nov. 2015	2015 International Symposium on Antennas and Propagation (**ISAP2015**)	Tasmania, Australia	**Reported** on this issue
18 Oct. - 22 Oct. 2015	37th IEEE International Telecommunication Energy Conference (**INTELEC 2015**)	Osaka, Japan	**Reported** on this issue
14 Oct. - 16 Oct. 2015	The 21st Asia-Pacific Conference on Communications (**APCC2015**)	Kyoto, Japan	**Reported** on this issue

Please confirm with the following IEICE-CS web site for the latest information.
http://www.ieice.org/cs/conf/calendar.html

Special Section Calendar of IEICE Transactions on Communications

Issue	Special Section	Note
Feb. 2017	Antenna and Propagation Technologies Contributing to Realization of Next Generation Wireless Systems	Submission due**:** 20 May 2016 **See page 37**
Jan. 2017	Challenged Networking Technologies and Its Service Quality	Submission due**:** 10 May 2016 **See page 36**
Dec. 2016	Information Centric Networking: Paradigms, Technologies, and Applications	Submission due**:** 8 April 2016 **See page 35**
Nov. 2016	Deepening and Expanding of Information Network Science	Submission due**:** 18 March 2016 **See page 34**
Oct. 2016	Satellite Communication Technologies in Conjunction with Main Topics of JC-SAT2015	To be issued
Sep. 2016	Integration Technologies of Ambient Intelligence and Sensor Networks	To be issued
Aug. 2016	Advanced Information and Communication Technologies and Services in Conjunction with Main Topics of APCC2015	To be issued
Jul. 2016	No special section in this issue	
Jun. 2016	European ICT R&D Project Activities on Broadband Access Technologies in Conjunction with Main Topics of 2015 IEICE ICT Forum	To be issued
May 2016	Internet Architectures and Management Methods that Enable Flexible and Secure Deployment of Network Services	To be issued **soon**
Apr. 2016	Autonomous Decentralized Systems Technologies and Applications for Next-Generation Social Infrastructure	To be issued **soon**
Mar. 2016	Information and Communication Technology for Healthcare and Medical Applications in Conjunction with Main Topics of ISMICT2015	To be issued **soon**
Feb. 2016	Management for the Era of Internet of Things and Big Data	Vol. E99-B, No.2
Jan. 2016	Recent Progress in Antennas, Propagation and Wireless Systems Related to Topics in ISAP2014	Vol. E99-B, No.1
Dec. 2015	No special section in this issue	
Nov. 2015	No special section in this issue	
Oct. 2015	5G Radio Access Networks [Part II] Multi-RAT Heterogeneous Networks and Smart Radio Technologies	Vol. E98-B, No.10
Sep. 2015	Emerging Technologies on Ambient Sensor Networks toward Future Generation	Vol. E98-B, No.9

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http://www.ieice.org/event/ronbun-e.php?society=cs

Call for Papers

------- Special Section on Deepening and Expanding of Information Network Science -------

The IEICE Transactions on Communications announces that it will publish a special section entitled "Special Section on Deepening and Expanding of Information Network Science" in the **November 2016** issue**.**

Information networking technologies have been achieving tremendous growth as an indispensable infrastructure in our society. In particular, the recent advances in chip technology have required us to redefine the real world management of massive systems, which might be also complex and presumably made up with a variety of component devices, such as the Internet of Things. However, it is almost impossible to manage and control overall behavior of the whole system merely by knowing and assuming the behavior of its subsystems, such as independent devices or communication protocols being used in the network. Therefore, it is a sort of "recursive" approach that is quite essential for the real world implementation of the next generation networks. In this scenario, we first deepen the academic frameworks themselves for better explaining the onset of nontrivial behavior at macroscopic levels. Then, by applying such frameworks to our system, we reconsider and improve every specification for the components of the network to benefit its system performance, stability, or robustness. For this purpose, we encourage not only multidisciplinary studies around information communication technologies but also a wider spectrum of academic approaches including mathematical engineering, theoretical physics, biological system engineering, computer science, and applied mathematics, etc. Longer or extended version of the works that have been presented at the Korea-Japan Joint Workshop on Complex Communications Sciences (KJCCS2016) will be also welcomed as the submissions. We are thus planning to publish a special section (scheduled to appear in the November 2016 issue) to further promote research and development of progress in information network science.

1. Scope

This special section aims at timely dissemination of research in these areas. Possible topics include, but are not limited to:

-deepening and expanding the frameworks for information network science
-theory of information network as complex systems, or applications to multimedia communication
-novel modeling, performance measure, analyzing methods for information network or multimedia communication
-theory and/or application of network information theory, such as network coding
-theory and/or application of techniques in multimedia communication to information network
-theory of nature-inspired information networking
-theory and/or application of information networking as social networks
-physical systems and devices inspired by network science
-novel network analysis method based on computer science and applied mathematics
-theory and/or application of very large-scale systems including Internet of Things (IoT)
-novel approach to information networks, such as information geometry and statistical mechanics

2. Submission Instructions

The standard number of pages is 8. The page charges are considerably higher for extra pages. Manuscripts should be prepared according to the guideline in the "Information for Authors." The latest version is available at the web site, http://www.ieice.org/eng/shiori/mokuji_cs.html. The term for revising the manuscript after acknowledgement of conditional acceptance for this special section could be shorter than that for regular issues (60 days) because of the tight review schedule.

This special section will accept papers only by electronic submission. Submit a manuscript and electronic source files (LaTeX/Word files, figures, authors' photos and biographies) via the IEICE Web site https://review.ieice.org/regist/regist_baseinfo_e.aspx by **March 18, 2016 (JST)**. Authors should choose the Deepening and Expanding of Information Network Science as a "Journal/Section" on the online screen. Do not choose [Regular EB].

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Call for Papers

------- Special Section on Information Centric Networking: Paradigms, Technologies, and Applications -------

The IEICE Transactions on Communications announces that it will publish a special section entitled “Special Section on Information Centric Networking: Paradigms, Technologies, and Applications” in the December 2016 issue.

As a future Internet technology, researches on Information Centric Networking (ICN) are being active globally, which uses information or content itself as an identifier of communication instead of IP addresses. It is urgently necessary to establish the basic technology of ICN systematically to overcome difficult problems existing on academic and scientific base of the current information network, such as accommodation for a huge number of different devices, diversification, complication, mobility, virtualization, energy saving, safety, and trustworthy. In this respect, approaches are required from various perspectives of not only current communication engineering but also interdisciplinary research fields including deployment, operations, and management. Therefore, a special section is being planned to further promote research and development of ICN for future networks.

1. Scope

This special issue aims to identify emerging research topics regarding Information Centric Networking. The topics covered by this special issue include, but not limited to, the following topics. Also, closely related topics such as content-based networks including CDN (Content Delivery Network), content-based dissemination, and/or contents acquisition are welcome.

- **Information-Centric Networking Architecture**
  Information-Centric Networking Architecture Design, Content-based Routing, In-network Caching, Autonomous Distributed System, Edge/Fog Computing, Cloud, Energy Aware Networks
- **Information-Centric Networking Principles**
  Content-based Measurement and Analysis, Content Provisioning, BigData Processing, Social Network Analysis, Network Performance Evaluation, Modeling Information-Centric Networks
- **Information-Centric Networking Substrate Technologies**
  Name Resolution Protocols, Packet Processing, Node Architecture, Content Mobility, Content Access Controls, Privacy and Security, ID/Locator Separation, Transport Techniques, Flow Controls
- **Information-Centric Networking Applications**
  M2M, IoT, Home Networks, Sensor Networks, Cyber Physical Systems, Testbeds

2. Submission Instructions

The standard number of pages is 8. The page charges are considerably higher for extra pages. Manuscripts should be prepared according to the guideline in the "Information for Authors." The latest version is available at the web site, http://www.ieice.org/eng/shiori/mokuji_cs.html. The term for revising the manuscript after acknowledgement of conditional acceptance for this special section could be shorter than that for regular issues (60 days) because of the tight review schedule.

This special section will accept papers only by electronic submission. Submit a manuscript and electronic source files (LaTeX/Word files, figures, authors’ photos and biographies) via the IEICE Web site https://review.ieice.org/regist/regist_baseinfo_e.aspx by **April 8, 2016 (JST)**. Authors should choose the Information Centric Networking: Paradigms, Technologies, and Applications as a "Journal/Section" on the online screen. Do not choose [Regular EB].

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Call for Papers

------- Special Section on Challenged Networking Technologies and Its Service Quality -------

The IEICE Transactions on Communications announces that it will publish a special section entitled "Special Section on Challenged Networking Technologies and Its Service Quality" in the **January 2017** issue**.**

Challenged networks represent network environments characterized by one or more challenges to establish end-to-end communication such as intermittent connectivity and large delay. In challenged networking technologies, various attractive and feasible approaches have been proposed so far. Recently, many studies have been trying to adapt them to real environments, such as disaster area and car environments. Because the challenged networking technologies have different features from current end-to-end communications, they will be required to be integrated with existing networking technologies and to bring novel applications and services. In order to achieve them, it is important to support various research activities of challenged networking technologies such as their applications, services, communication protocols, security, simulation tools, analysis, testbed etc. We thus call for publications (scheduled to appear in the January 2017 issue) for promoting research and development of Challenged Networking Technologies achieving adequate Quality of Experience.

1. Scope

This special section aims at timely dissemination of research in these areas. Possible topics include, but are not limited to:

- Challenged Networking Architecture
  * Delay-/Disruption-Tolerant Network, Mobile Ad Hoc/Sensor Network, Opportunistic Network, Vehicular Network, Underwater Network, Aero Network etc.
  * Routing Protocol, Transport Protocol, Traffic Control, Message Dissemination etc.
  * Integration with Cloud Service
  * M2M, D2D
- Applications and Services for Challenged Networking
- Emergency Communications in Disaster Areas
- Mobility Model for Challenged Networking
- Simulation/Emulation/Testbed Tools for Challenged Networking
- Communication Quality, Quality of Service, and Quality of Experience in Challenged Networking
- Security for Challenged Networking
- Case Studies Involving Implementations and Experiments Adapted to Real Environment

2. Submission Instructions

The standard number of pages is 8. The page charges are considerably higher for extra pages. Manuscripts should be prepared according to the guideline in the "Information for Authors." The latest version is available at the web site, http://www.ieice.org/eng/shiori/mokuji_cs.html. The term for revising the manuscript after acknowledgement of conditional acceptance for this special section could be shorter than that for regular issues (60 days) because of the tight review schedule.

This special section will accept papers only by electronic submission. Submit a manuscript and electronic source files (LaTeX/Word files, figures, authors' photos and biographies) via the IEICE Web site https://review.ieice.org/regist/regist_baseinfo_e.aspx by **May 10th 2016 (JST)**. Authors should choose the Challenged Networking Technologies and Its Service Quality as a "Journal/Section" on the online screen. Do not choose [Regular EB].

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Call for Papers

------- Special Section on Antenna and Propagation Technologies Contributing to Realization of Next Generation Wireless Systems -------

The IEICE Transactions on Communications announces that it will publish a special section entitled “Special Section on Antenna and Propagation Technologies Contributing to Realization of Next Generation Wireless Systems” in the February 2017 issue.

Since 5G (fifth generation) mobile communication systems are expected to offer a dramatically high system capacity, the antenna technology based on the non-conventional requirements and propagation technology considering the new systems are actively studied. Moreover, a tremendous number of devices will communicate each other at the same time for IoT (Internet-of-Things) / M2M (Machine-to-Machine) applications, and this gives a new viewpoint to the studies on the antenna and propagation. Especially, the antenna and propagation technologies suitable for resolving the issues, such as a spectral resource and energy consumption, are remarkably investigated. With respect to this current trend, this special section focuses on the antennas, propagation, and antenna related technologies for the next generation wireless systems. Furthermore, the special section widely seeks for the paper submissions with the state-of-art technology, aiming to share the trends and further development of this field. The special section will be issued in February 2017 to promote the further investigations of the antennas-and-propagation related research and development. The authors related to this field are strongly encouraged to submit their original research papers.

1. Scope

This special section aims at timely dissemination of research in these areas. Possible topics include, but are not limited to:

Antennas	Propagation	Antenna System
-Miniaturized antennas for mobile handsets	-Propagation theory and measurements	-Diversity antennas
-Antennas for base stations	-Outdoor and indoor propagation	-MIMO antennas
-Active and integrated antennas	-Millimeter wave propagation	-Massive MIMO systems
-Reconfigurable antennas	-Body area propagation	-Beamforming and signal processing
-Body-centric antennas	-M2M propagation	-DOA estimation
-RFID antennas	-Propagation for multiuser/cooperative systems	-Short range communication
-Millimeter wave antennas	-Other related topics	-Other related topics
-Reflect arrays and transmit arrays		
-Other related topics		

2. Submission Instructions

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Society	Transactions	Editorial Subject Indexes
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B (Communications)	EB (English) B (Japanese)	Fundamental Theories for Communications, Devices/Circuits for Communications, Transmission Systems and Transmission Equipment for Communications, Optical Fiber for Communications, Fiber-Optic Transmission for Communications, Switching for Communications, Switching for Mobile Communications, Network, Network Management/Operation, Internet, Wireless Communication Technologies, Terrestrial Radio Communications, Satellite Communications, Optical Wireless Communications, Antennas and Propagation, Electromagnetic Compatibility (EMC), Sensing, Navigation, Guidance and Control Systems, Energy in Electronics Communications, Terminals for Communications, Multimedia Systems for Communications, Broadcast Systems, Integrated Systems for Communications, Space Utilization Systems for Communications
C (Electronics)	EC (English) C (Japanese)	Electromagnetic Theory, Lasers, Quantum Electronics, Optoelectronics, Microwaves, Millimeter-Waves, Ultrasonic Electronics, Electronic Circuits, Electronic Materials, Organic Molecular Electronics, Electronic Components, Electromechanical Devices and Components, Semiconductor Materials and Devices, Integrated Electronics, Electron Tubes, Vacuum and Beam Technology, Electronic Displays, Superconducting Electronics, Storage Technology, Electronic Instrumentation and Control
D (Information and Systems)	ED (English) D (Japanese)	Computation and Computational Models, Automata and Formal Language Theory, Algorithm Theory, Complexity Theory, Computer Components, VLSI Systems, Computer Systems, Fundamentals of Software and Theory of Programs, System Programs, Software Engineering, Database, Contents Technology and Web Information Systems, Data Mining, Networks, Dependable Computing, Application Information Security, Distributed Cooperation and Agents, Artificial Intelligence and Cognitive Science, Human-computer Interaction, Office Information Systems, e-Business Modeling, Educational Technology, Rehabilitation Engineering and Assistive Technology, Pattern Recognition, Speech and Hearing, Image Processing and Video Processing, Image Recognition, Computer Vision, Computer Graphics, Multimedia Pattern Processing, Natural Language Processing, Biocybernetics, Neurocomputing, Biological Engineering, Music Information Processing, Kansei Information Processing, Affective Information Processing
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Student member (overseas)	–	2,000	2,000 / 1society	6,000
Student member (overseas) with OMDP*	–	1,000	1,500 / 1society	6,000

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Surface mail charge is included in the membership charge. Optional rapid mailing service is available by air mail or surface air lifted (SAL) mail. The additional charge per year periodical depends on the mailing address, as shown in the right table.

Areas	Air mail	SAL mail
Asia; Guam; Midway islands	5,600 yen	3,200 yen
Oceania; Near & Middle East; North & Central America; Europe	7,800 yen	4,400 yen
Africa; South America	11,000 yen	5,600 yen

Please contact the IEICE Membership Section: E-mail:member@ieice.org FAX: +81 3 3433 6659 ***Please fill out the application form printed on the next page.***

IEICE Overseas Membership Application Form

URL http://www.ieice.org/eng/member/OM-appli.html **E-mail** member@ieice.org **FAX** +81-3-3433-6659

◆ **Please type or print in English. The deadline for submitting application form is the 1st day of every month.**

Personal Information

Full name: _____ ***Nationality:*** _____ ☐Male ☐Female
First name Middle name Last name

☐Prof. ☐Dr. ☐Mr. ☐Ms. ***Place of birth:*** _____ ***Date of birth:*** _____
Day Month Year

Mailing Address ☐Home ☐Office

Name of Company/School/College Department/Section

Street City State/Province

Postal code Country

TEL FAX E-mail

Academic Background The highest academic degree: ☐Ph.D. ☐Masters ☐Bachelors ☐Others: _____

University/college/school of the highest academic degree Month & year of graduation

(For Student Member) Academic degree which will be conferred on you Month & year when the degree will be conferred on you

Application Information

Membership: I want to apply for the following membership (check one item!)

☐Member (Overseas) ☐Student Member (Overseas)

◆If you want to apply for OMDP, please check; ☐OMDP (Overseas Membership Development Program)

Society registration (Membership fee includes one Society of Transaction of Online version.):

☐A: Engineering Sciences ☐B: Communications ☐C: Electronics ☐D: Information and Systems

Additional Society (optional): ☐A: Engineering Sciences ☐B: Communications ☐C: Electronics ☐D: Information and Systems

Additional Transactions of paper version (optional):

☐EA: Fundamentals ☐EB: Communications ☐EC: Electronics ☐ED: Information and Systems

☐A: Fundamentals (Japanese) ☐B: Communications (Japanese) ☐C: Electronics (Japanese) ☐D: Information and Systems (Japanese)

Journal subscription (optional): ☐(Japanese)

Remittance Remittance is available only in *Japanese yen* by a *credit card*.

Admission charge……¥_____ Journal subscription (optional)……..¥_____

Annual charge……¥_____ Mailing option: ☐Air mail……..……¥_____

Additional Society (optional) …… ¥_____ ☐SAL mail……¥_____

Additional Transactions (optional)……..…¥_____ **Total……..……¥** _____

Credit Card: ☐UC ☐Master Card ☐VISA ☐JCB ☐American Express

Card number: | | | | | | | | | | | | | | | | |

Expiry date: ____/____ Credit Card Holder: _____ Signature: _____
Year Month

Endorsement

Endorsements by one IEICE Member application is required. If it is difficult to find endorsers, please contact the IEICE Membership Activities Section by sending this sheet, and we will help you.

I recommend this applicant for IEICE membership.

Endorser's name Membership number Endorser's signature Date

IEICE-CS Overseas Membership with Special Annual Fees for Sister Society Members

To foster the cooperation between the Sister Society and the IEICE Communications Society (IEICE-CS), the Sister Society agreement enables members of each institution to become members of both societies by granting special annual fees.

A 10% - 20% discount* of the annual fees will be granted to the sister society members to become the IEICE-CS overseas members. The discounted fees will be applied for the individual members when the new membership is starting or the current membership is renewing.

* The discount does not apply to the optional items and services i.e. “Additional Society”, “Additional Transactions of paper version” and “Rapid Mailing Service”.

------ Please send the following Sister Society membership information, together with membership application form in the next page. ------

Sister Society membership information

To apply discount rates for this IEICE-CS Sister Society member’s application, please indicate your Sister Society Membership number below, and attach a copy of your Sister Society Membership certificate or card to this form.

Sister Society: ☐IEEE ComSoc ☐KICS ☐VDE-ITG

Membership number (Member):_____

Copy of Membership certificate or Membership card:

(Attached here)

IEICE Communications Society - GLOBAL NEWSLETTER
Submission Guideline

First version in only Japanese: May 30, 2008
Second version in only Japanese: Feb. 13, 2009
Third version in only Japanese: Jul. 22, 2010
Forth version in English and Japanese: Mar. 8, 2011
Ver 5.0 : August 10 2013

1. About GLOBAL NEWSLETTER

The Institute of Electronics, Information and Communication Engineers Communications Society (IEICE-CS) GLOBAL NEWSLETTER has been established since 2002. We quarterly publish an English newsletter every March, June, September, and December.

1.1. Goal

Our goal is to share information between overseas/foreign members and other members in IEICE-CS as a global activity, and to show IEICE presence internationally.

1.2 Category of Articles

1) Messages from President/Vice President
   - An inaugural message from CS President is published once per year in June. Message from CS Vice President is published properly.
2) IEICE-CS Activities Now
   - IEICE General/Society Conference information/reports
   - Activities of Technical Committees
   - International activities of the society
3) IEICE-CS Related Conferences Reports
   - Information/reports on IEICE-CS related conferences
   - IEICE-CS Conferences Calendar (*)
4) Others
   - Essays, Laboratory activity reports, Technology reports, Messages from overseas/foreign members, etc.
   - Information from Sister Societies
   - Special topics (*)
5) IEICE-CS Information
   - Call for papers
   - From editor’s desk (*)

*: planned / written by IEICE-CS Directors, Planning and Members Activities

2. Major notes for Contribution

Basically, IEICE-CS members and readers can contribute articles. IEICE-CS Directors, Planning and Members Activities may ask non-IEICE-CS members to contribute articles. The articles should be fruitful and profitable for IEICE-CS members, **NOT** for particular organization. IEICE-CS Directors, Planning and Members Activities may not accept an article for publication if it does not follow this guideline.

2.1 Template and Language

Please use template downloadable at the URL:
http://www.ieice.org/cs/pub/global_howto.html
Please use English for all articles.

2.2 Number of pages

Two to four pages are preferable. One page article is also acceptable. The maximum number of pages is eight. When you try to entry a contribution with five to eight pages, you need to negotiate with IEICE-CS Directors, Planning and Members Activities.

3. Copyright

The copyrights of all articles in the GLOBAL NEWSLETTER should belong to the IEICE. However, the original authors retain the right to copy, translate or modify their own manuscripts. In cases when a manuscript is translated into another language or when any portion of the manuscript is to be submitted to another publication, authors

should register the action with the IEICE, and the original manuscript should be clearly cited in the publications. Please see a web site related to IEICE provisions on copyright.
http://www.ieice.org/eng/about/copyright.html

4. Publication fee / Manuscript fee
No publication fee and no manuscript fee for all articles.

5. Schedule
Standard editing schedule is as follows. Please note that the schedule may vary due to public holidays or other circumstances. The exact deadlines are indicated in call for newsletters.

Publication date	1st , Mar.	1st, Jun.	1st, Sept.	1st, Dec.
Call for newsletters	1st Mon., Dec.	1st Mon., Mar.	1st Mon., Jun.	1st Mon., Sept.
Contribution entry	4th Fri., Dec.	4th Fri., Mar.	4th Fri., Jun.	4th Fri., Sept.
Submission of Manuscript/Copyright	3rd Fri., Jan.	3rd Fri., Apr.	3rd Fri., Jul.	3rd Fri., Oct.

5.1 Call for Newsletters
IEICE-CS Directors, Planning and Members Activities will give you the information on call for newsletters.

5.2 Contribution Entry
You should send **information on title, summary(around 50 words or less) and number of page** to IEICE-CS Directors, Planning and Members Activities by e-mail.
E-mail: cs-gnl@mail.ieice.org

5.3 Submission of Manuscript
You should send a manuscript both in word file and pdf file to IEICE-CS Directors, Planning and Members Activities by e-mail.
E-mail: cs-gnl@mail.ieice.org

5.4 Submission of COPYRIGHT TRANSFER FORM
COPYRIGHT TRANSFER FORM can be downloaded at:
http://www.ieice.org/cs/pub/global_howto.html
Signed **COPYRIGHT TRANSFER FORM** should be sent by one of the following ways:
- By email.
- By facsimile.

Address to send:
- In case of email: cs-gnl@mail.ieice.org
- In case of facsimile:
  Name: Publications Department, IEICE
  Facsimile: +81-3-3433-6616, Phone: +81-3-3433-6692

6 Contact Point
IEICE-CS Directors, Planning and Members Activities in charge of IEICE-CS GLOBAL NEWSLETTER, cs-gnl@mail.ieice.org

From Editor's Desk

• Communications Society Welcome Party in IEICE General Conference

The IEICE General Conference 2016 will be held at Kyushu University, Fukuoka, March 15th – 18th, 2016. On the first day of the conference, Communications Society is going to hold the Welcome Party from 17:30 to 19:00 at the Cafeteria in the campus. The objective of the party is to provide young engineers especially students with a good opportunity to meet and talk friendly with experienced researchers and engineers in various organizations. Anybody can join in the party for free.

Please come and join the Welcome Party in the evening of the first day !

For the information on the IEICE General Conference 2016, please check out the latest information on the IEICE web site at: http://www.toyoag.co.jp/ieice/E_G_top/e_g_top.html

IEICE-CS GLOBAL NEWSLETTER Editorial Staff

Editorial Staff of this issue

No special order is observed.

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ISAP2016 OKINAWA JAPAN

ISAP 2016

ISAP2016

Call for Papers

2016 INTERNATIONAL SYMPOSIUM ON ANTENNAS AND PROPAGATION
October 24-28, 2016, Okinawa, Japan,
Okinawa Convention Center

Okinawa is a Paradise of Eternal Summer

Okinawa located at the southern end of Japan is famous for its beautiful white sandy beaches, coral reefs, crystal-clear blue seas, and beautiful natural scenery.

The ISAP2016 will be held at the Okinawa Convention Center (OCC) which is located 11km away of north-west side from Naha downtown. OCC filled with sunlight, adjoining the beach a marina, and a seaside park, the area offers the best of resort & conference destinations.

IEICE Communications Society · IEEE · AP-S · U.R.S.I. · IET The Institution of Engineering and Technology · EurAAP · KIEES

SCOPE

A. Antennas

- A1. Small Antennas and RF Sensors
- A2. Antennas for Mobile and Wireless Applications
- A3. Broadband and Multi-band Antennas
- A4. Active and On-Chip Antennas
- A5. Tunable and Reconfigurable Antennas
- A6. 2D and 3D Printed Antennas and Arrays
- A7. Adaptive and Smart Antennas
- A8. Antenna Theory and Design
- A9. Antenna Measurements
- A10. Millimeter-wave, THz and Optical Antennas

B. Propagation

- B1. Indoor and Mobile Propagation
- B2. Millimeter-wave, THz and Optical propagaiton
- B3. Machine-to-Machine/Infrastructure Propagation
- B4. Channel Sounding and Channel Estimation
- B5. DOA Estimation
- B6. Remote Sensing and Radar
- B7. Terrestrial, Earth-Space, and Ionospheric Propagation
- B8. Propagation Fundamentals
- B9. Propagation Measurement Techniques

C. Electromagnetic-wave Theory

- C1. Computational Electromagnetics
- C2. Time-Domain Techniques
- C3. Scattering, Diffraction, and RCS
- C4. Inverse and Imaging Techniques
- C5. Optimization Methods in EM Problems
- C6. Passive and Active Components
- C7. Frequency Selective Surfaces and Filters
- C8. EBG, Metamaterials, and Appilications
- C9. Nano-Electromagnetics

D. AP-related Topics

- D1. Antenna Systems for Mobile Communications
- D2. MIMO and Its Applications
- D3. Broadcasting and Receiving Technologies
- D4. Wireless Power Transfer Technologies
- D5. Wearable Device Networks and Medical Applications
- D6. Sensor Networks and Adhoc Systems
- D7. RFID and Applications
- D8. EMC/EMI Technologies

IMPORTANT DATES

April 22, 2016
Deadline for paper submission

June 24, 2016
Notification of accepted papers

August 31, 2016
Deadline for early registration


World heritage Shurijo Castle


Okinawa Churaumi Aquarium

PREPARATION OF PAPERS

Original papers are solicited that have not been presented previously and that describe new contributions in the area suggested in the SCOPE. Each author is requested to prepare a 2-page camera-ready paper in 2-column format written in English, including all text, references, figures and photographs. The authors are requested to refer to the ISAP2016 Web page (http://www.isap2016.org/) for the detailed paper preparation instructions and the IEICE Copyright Transfer Form.

SUBMISSION OF PAPERS

Authors are requested to send their papers in IEEE Xplore-compliant PDF format electrically. Presented papers of ISAP2016 will be included in ISAP Archives, I-Scover and IEEE Xplore.

WORKSHOP

Several workshops are scheduled to be held on October 24 (Monday), 2016.

EXHIBITION

Spaces for demonstration of software, books and products are also available with charge.

AWARDS

Several outstanding papers will be awarded for ISAP2016 Paper Awards. ISAP2016 also hosts Student Paper Awards in order to foster activities of students and young researchers toward highly qualified researchers.

SPECIAL SECTION ON IEICE TRANS

The Special Section on ISAP2016 will be planned in the IEICE Transactions on Communications.

ISAP ARCHIVES

ISAP Archives currently opens as a trial service. You can search and read the conference papers from the ISAP1971 to 2014 at the ISAP Archives Web page (http://ap-s.ei.tuat.ac.jp/isapx/).

STEERING COMMITTEE

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Contact E-mail : ap_ac-isap2016@mail.ieice.org

Sponsored and organized by :

The Communications Society of the Institute of Electronics, Information and Communication Engineers (IEICE)

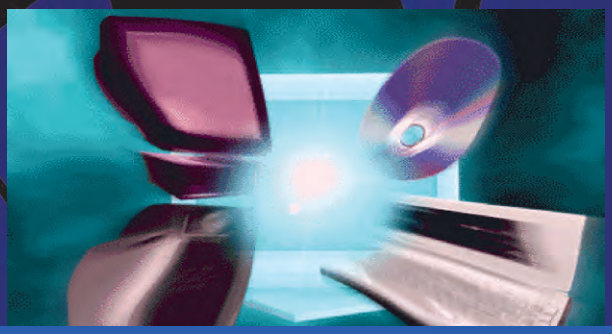
Co-sponsored by:

- The Antennas and Propagation Society of the Institute of Electrical and Electronics Engineers (IEEE/AP-S)
- The International Union of Radio Science (URSI)
- The Antennas and Propagation Network of the Institute of Engineering and Technology (IET)
- The European Association on Antennas and Propagation (EurAAP)
- Antenna Society of China Institute of Electronics (AS-CIE)
- Chinese Microwave Association (CMA)
- Institute of Antenna Engineers of Taiwan (IAET)
- Radio - Electronics Association of Vietnam (REV)
- The Korean Institute of Electromagnetic Engineering and Science (KIEES)
- The Electrical Engineering/Electronics, Computer, Communications, Information Technology Association of Thailand (ECTI)

Further information can be found on the Website **ISAP2016 Web Page | http://www.isap2016.org**

To Probe Further and Keep Up-to-date with Communication Technologies

IEICE Communications Society



Notice from GLOBAL NEWSLETTER

Changing IEICE-CS GLOBAL NEWSLETTER in printed version to online version

The IEICE-CS GLOBAL NEWSLETTER (GNL) has been established since 2002. We quarterly publish an English newsletter every March, June, September and December. The printed version of these magazines has been delivered including a lot of useful information and interesting contents to IEICE CS members. We are now considering changing GNL in printed version to online version. As the first step of this change, the printed version will be delivered only for the overseas member from next fiscal year, and publishing GNL in the website at:
https://www.ieice.org/cs/pub/global_news.html

iScover
IEICE Knowledge Discovery®

With I-Scover (http://i-scover.ieice.org), you can easily search articles including related keywords efficiently. I-Scover covers about 199,000 articles from IEICE transactions, IEICE technical reports, proceedings of the IEICE General/Society conferences and some IEICE related international conferences.

(*) Depending on material, IEICE membership account, password attached to proceedings DVD, etc. may be required to view PDF contents.

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